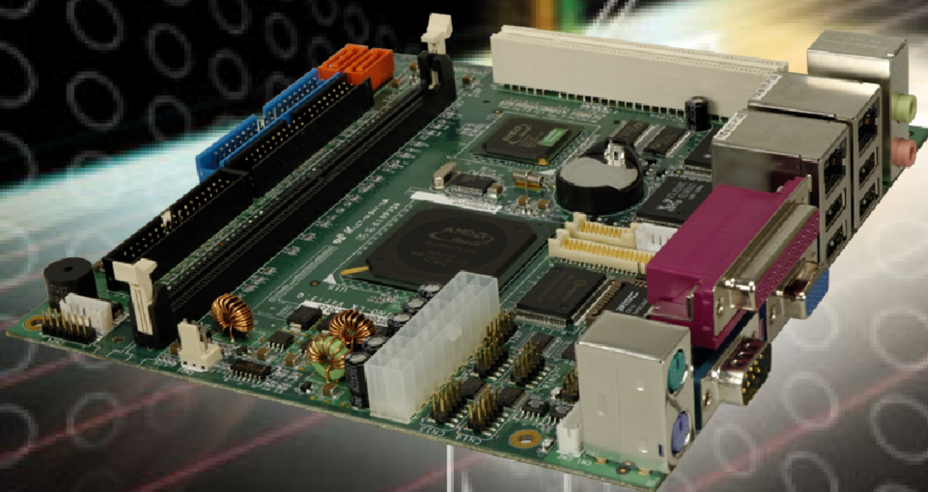
IEI Technology Corp.



KINO-LX

Mini-ITX Motherboard with AMD® LX800 500MHz CPU

Dual LAN, SATA, USB, 6xCOM and Audio

User Manual

Rev. 1.0 November, 2006

RoHS Lead Free

REVISION HISTORY

Title	KINO-LX Motherboard	
Revision Number	**Description**	**Date of Issue**
1.0	**Initial release**	**November 2006**

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TRADEMARKS

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Glossary

AC '97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
ICH4	I/O Controller Hub 4
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

Chapter 1

Introduction

1.1 KINO-LX Motherboard Overview

The mini-ITX form factor KINO-LX is fully equipped with advanced multi-mode I/Os. The KINO-LX is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price. The KINO-LX is equipped with an on-board low-power consumption and high performance AMD™ Geode™ LX 800 processor.

1.1.1 KINO-LX Applications

The KINO-LX is designed for applications in the following areas:

- Industrial PC applications
- Human Machine Interface (HMI) applications
- Marine, GPS and transportation applications
- Financial, retail and kiosk applications

1.1.2 KINO-LX Benefits

Some of the KINO-LX benefits include:

- Low power, high performance
- Multiple storage option integration including
  - 40 Pin IFM or 3.5" HDD
  - 34 Pin floppy disk drive (FDD) support
  - Dual SATA ports with RAID 0 and RAID 1 support
- Data security SATA RAID support

1.1.3 KINO-LX Features

Some of the KINO-LX features are listed below:

- Complies with mini-ITX form factor
- Complies with RoHS
- Embedded AMD™ Geode™ LX 800 CPU
- Supports a maximum front side bus (FSB) speed up to 500MHz
- DDR 333MHz up to 1GB
- Complete I/O support with IDE, Dual LAN, 4 x USB2.0 and 6 x COM ports

- Supports 24-bit TTL LCD and single channel 18-bit LVDS LCD
- Comes with two high performance 10/100MB Ethernet controllers
- Supports two SATA channels with transfer rates up to 150Mb/s

1.2 KINO-LX Overview

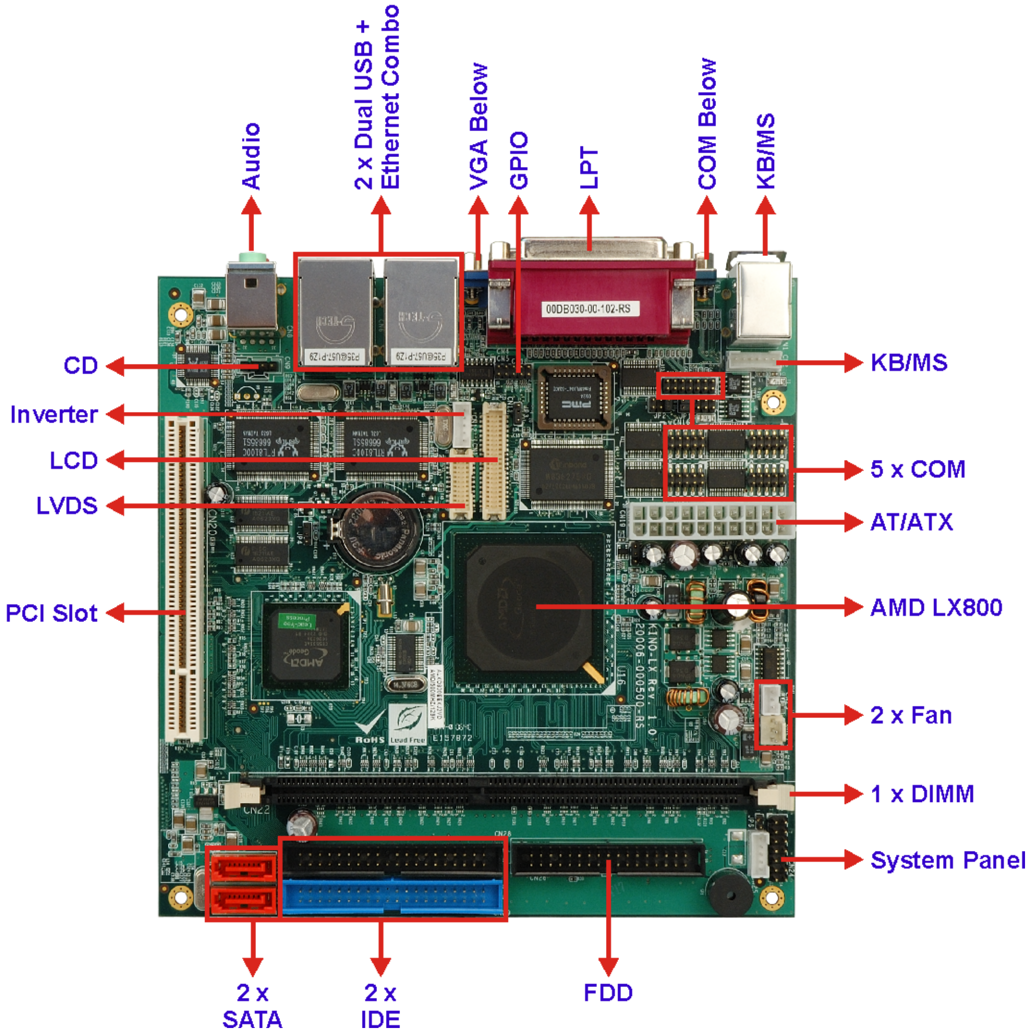


Figure 1-1: KINO-LX Overview

1.2.1 KINO-LX Connectors

The KINO-LX has the following connectors onboard:

- 1 x 184-pin DDR DIMM socket
- 1 x AT/ATX power connector
- 1 x CD-IN connector

- 2 x Fan connectors
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x GPIO connector
- 2 x IDE Interface connectors
- 1 x Inverter power connector
- 1 x Keyboard/Mouse connector
- 1 x LCD LVDS interface Connector
- 1 x LCD TTL interface Connector
- 1 x RS-422/485 serial port connector
- 1 x PCI slot connector
- 4 x RS-232 serial port connectors
- 1 x RS-232/422/485 serial port connector
- 2 x SATA connectors

The KINO-LX has the following connectors on the board rear panel:

- 1 x Audio connector (two audio jacks)
- 2 x Ethernet connectors
- 2 x PS/2 keyboard/mouse connectors
- 1 x LPT port connector
- 1 x RS-232 serial port connector
- 4 x USB connectors
- 1 x VGA connector

The KINO-LX has the following onboard jumpers:

- AT/ATX power mode select
- Clear CMOS
- COM1/2 RI and voltage select
- COM2 RS-232/422/485 select
- LCD clock setup
- LCD voltage select

The location of these connectors on the motherboard can be seen in **Figure 1-1**. These connectors are fully described in **Chapter 3**.

1.2.2 Technical Specifications

KINO-LX technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2**.

SPECIFICATION	DESCRIPTION
CPUs Supported	AMD™ Geode™ LX 800
Cache Memory	64K I/ 64k D L1 cache, 128K L2 cache
System Chipset	AMD™ CS5536
I/O Controller	AMD™ CS5536
Memory	One 184-pin DDR 333MHz DIMM up to 1GB
PCI Bus Interface	Revision 2.2
Super IO	W83627EHG
Display	CRT integrated in AMD™ LX 800
LVDS	Single channel 18 bit LVDS integrated in AMD™ LX 800
TTL	24 bit TTL integrated in AMD LX 800
HDD Interface	One IDE channel supports two Ultra ATA 100/66/33 devices
Power Support	ATX power support
Power Consumption	+5V @ 1.45A, +12V @ 0.08A LX-800, 500MHz, DDR 333MHz/512MHz MB-HCT
Power Management	Supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 2.0
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Serial ATA (SATA)	Two SATA channels with 150Mb/s transfer rates
Floppy Disk Drive (FDD)	Supports FDD
USB Interfaces	Four USB 2.0 connectors supported
Serial Ports	Six RS-232 and one RS422/485 COM ports
Audio Interfaces	Realtek ALC203
PCI Interface	PCI slot connector
Real Time Clock	256-byte battery backed CMOS RAM
Hardware Monitoring	CPU temperature and system voltages
Ethernet	10/100 Base-T RTL8100C
BIOS	AWARD

SPECIFICATION	DESCRIPTION
Physical Dimensions	170mm x 170mm
Operating Temperature	Minimum: 0ºC (32°F) - Maximum: 60°C (140°F)
Operating Humidity	Minimum: 5% - Maximum: 95%
Weight	Gross: 1.1Kg - Net: 500g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 CPU Support

The KINO-LX has a preinstalled AMD LX 800 processor. Technical specifications for the AMD LX 800 processor are listed below:

- x86/x87-compatible core
- Processor frequency up to 500 MHZ
- 64K I/64K D L1 cache and 128K L2 cache
- Split I/D cache/TLB (Translation Look-Aside Buffer)
- 64-bit DDR Memory interface. 333MHz DDR memory supported
- Integrated FPU that supports the Intel MMX® and AMD 3DNow!™ Technology instruction sets
- 9 GB/s internal GeodeLink™ Interface Unit (GLIU)
- Security Block
    - 128-bit AES (CBC/ECB)
    - True Random Number Generator
- High-resolution CRT and TFT outputs (simultaneous operation)
    - Support for High Definition (HD) and Standard Definition (SD) standards
    - Support 1920x1440 in CRT mode and 1600x1200 in TFT mode
- VESA 1.1 and 2.0 VIP/VDA support
- 0.13 micron process
- 481-terminal PBGA (Plastic Ball Grid Array) with internal heatspreader

Power management features for the AMD LX 800 processor are listed below:

- 1.8W Typical (3.9W TDP) @ 500MHz
- GeodeLink active hardware power management
- Hardware support for standard ACPI software power management
- I/O companion SUSP#/SUSPA# power controls
- Lower power I/O
- Wakeup on SMI/INTR

2.2 System Chipset

The KINO-LX motherboard has an AMD Geode™ CS5536 chipset installed. The AMD Geode™ CS5536 is a companion device for the AMD Geode™ LX 800 to create a high-performance, low-power x86 solution for embedded applications.

Technical specifications of the AMD Geode™ CS5536 chipset are listed below. For more information on these two chipsets please refer to the AMD website.

- **GeodeLink™ Interface Unit**:
  - 64-bit, 66MHz operation
  - PCI VSM (Virtual System Module) that makes the interface transparent to applications software and BIOS
  - Programmable routing descriptors, use and activity monitors, and SSMI (Synchronous System Management Interrupt)
- **ATA-6 Controller**:
  - 100 MB/second IDE Controller in UDMA mode per the ATA-6 specification
  - 5V interface
- **Flash Interface**:
  - Multiplexed with IDE interface Connects to an array of industry standard NAND Flash and/or NOR Flash
- **USB Controller**:
  - 4 USB ports
  - Supports both USB 1.1 and USB 2.0
  - 3 host ports
  - 1 host/device
- **Audio Codec 97 (AC97) Controller**:
  - AC97 specification v2.3 compliant interface to multiple audio codecs: Serial In, Serial Out, Sync Out, Bit Clock In
  - Legacy “PC Beep” support
- **Diverse Device**:
  - 82xx Legacy Devices
  - IR Communication Port
  - System Management Bus (SMB) Controller
  - LPC (Low Pin Count) Port
  - General Purpose I/Os (GPIOs)
  - 8 Multi-Function General Purpose Timers (MFGPTs)
  - Real-Time Clock (RTC) with CMOS RAM
- **Power Management Controller**:
  - ACPI v2.0 compliant

2.2.1 Data Flow

Figure 2-1 shows the data flow between the system chipset, the CPU and other I/O interfaces that can connect to the KINO-LX motherboard.

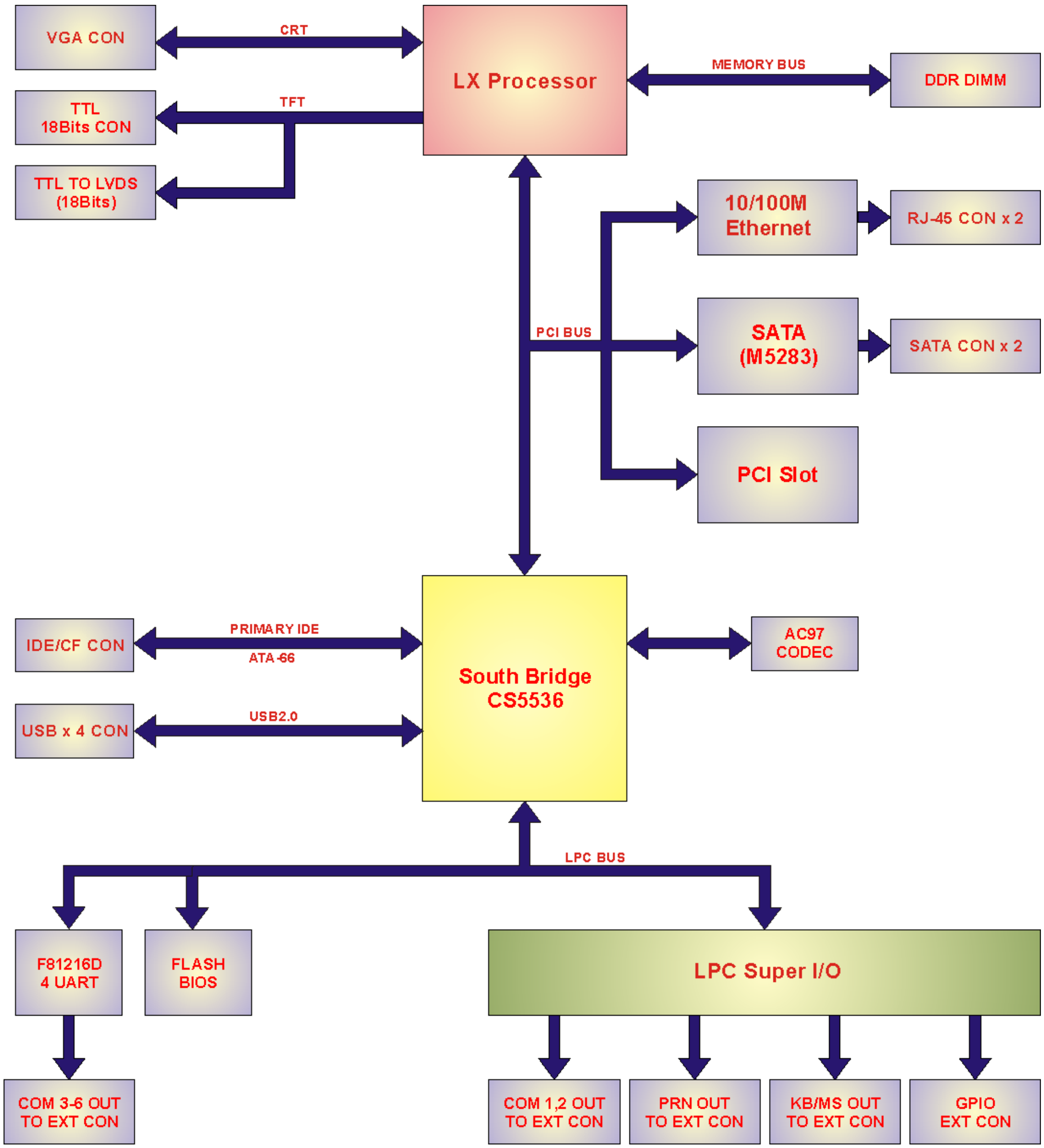


Figure 2-1: Data Flow Block Diagram

2.3 Graphics Support

Table 2-1 lists the KINO-LX graphics processor features.

Feature	AMD Geode™ LX Processor
Color Depth	8, 16, 32 bpp (A) RGB 4 and 8-bit indexed
ROPs	256 (2-src, dest and pattern)
BLT Buffers	FIFOs in Graphics Processor
BLT Splitting	Managed by hardware
Video Synchronized BLT/Vector	Throttle by VBLANK
Bresenham Lines	Yes
Patterned (stippled) Lines	Yes
Screen to Screen BLT	Yes
Screen to Screen BLT with mono expansion	Yes
Memory to Screen BLT	Yes (throttled rep movs writes)
Accelerated Text	No
Pattern Size (Mono)	8x8 pixels
Pattern Size (Color)	8x8 pixels
Monochrome Pattern	Yes (with inversion)
Dithered Pattern (4 color)	No
Color Pattern	8, 16, 32 bpp
Transparent Pattern	Monochrome
Solid Fill	Yes
Pattern Fill	Yes
Transparent Source	Monochrome
Color Key Source Transparency	Y with mask

Feature	AMD Geode™ LX Processor
Variable Source Stride	Yes
Variable Destination Stride	Yes
Destination Write Bursting	Yes
Selectable BLT Direction	Vertical and Horizontal
Alpha BLT	Yes (constant α, α/pix, or sep. α channel)
VGA Support	Decodes VGA Register
Pipeline Depth	Unlimited
Accelerated Rotation BLT	8, 16, 32 bpp
Color Depth Conversion	5:6:5, 1:5:5:5, 4:4:4:4, 8:8:8:8

Table 2-1: Geode LX Graphics Processor Features

2.4 Memory Support

Up to 1GB of DDR 333 MHz DIMM is supported.

2.5 Super I/O

- **General**
  - Meet LPC Spec. 1.01
  - Support LDRQ#(LPC DMA), SERIRQ (Serial IRQ)
  - Integrated Hardware Monitor functions
  - Compliant with Microsoft PC2000/PC2001 Hardware Design Guide
  - Support DPM (Device Power Management), ACPI
  - Programmable configuration settings
  - Single 24 or 48 MHz clock input
  - It is 3.3V level but 5V tolerance support
    - Besides LPC function pins(Pin21 ~ Pin30) and H/W monitor analog pins(Pin95 ~ Pin110)
    - Input level can up to 5V and maximum input level can be up to 5V+10%
- **FDC**

  - Compatible with IBM PC AT disk drive systems
  - Variable write pre-compensation with track selectable capability
  - Support vertical recording format
  - DMA enable logic
  - 16-byte data FIFOs
  - Support floppy disk drives and tape drives
  - Detects all overrun and underrun conditions
  - Built-in address mark detection circuit to simplify the read electronics
  - FDD anti-virus functions with software write protect and FDD write enable signal (write data signal was forced to be inactive)
  - Support up to four 3.5-inch or 5.25-inch floppy disk drives
  - Completely compatible with industry standard 82077
  - 360K/720K/1.2M/1.44M/2.88M format; 250K, 300K, 500K, 1M, 2M bps data transfer rate
  - Support 3-mode FDD, and its Win95/98 driver
- **UART**
  - Two high-speed 16550 compatible UARTs with 16-byte send/receive FIFOs
  - MIDI compatible
  - Fully programmable serial-interface characteristics:
    - 5, 6, 7 or 8-bit characters
    - Even, odd or no parity bit generation/detection
    - 1, 1.5 or 2 stop bits generation
  - Internal diagnostic capabilities:
    - Loop-back controls for communications link fault isolation
    - Break, parity, overrun, framing error simulation
  - Programmable baud rate generator allows division of 1.8461 MHz and 24 MHz by 1 to (216-1)
  - Maximum baud rate up to 921k bps for 14.769 MHz and 1.5M bps for 24 MHz
- **Infrared**
  - Support IrDA version 1.0 SIR protocol with maximum baud rate up to 115.2K bps
  - Support SHARP ASK-IR protocol with maximum baud rate up to 57,600 bps
- **Parallel Port**

- Compatible with IBM parallel port
- Support PS/2 compatible bi-directional parallel port
- Support Enhanced Parallel Port (EPP) - Compatible with IEEE 1284 specification
- Support Extended Capabilities Port (ECP) - Compatible with IEEE 1284 specification
- Enhanced printer port back-drive current protection

- **Game Port**
  - Support two separate Joysticks
  - Support every Joystick two axis (X, Y) and two button (A, B) controllers
- **MIDI Port**
  - The baud rate is 31.25 K baud
  - 16-byte input FIFO
  - 16-byte output FIFO
- **Keyboard Controller**
  - 8042 based with optional F/W from AMIKKEYTM-2, Phoenix MultiKey/42TM or customer code with 2K bytes of programmable ROM, and 256 bytes of RAM
  - Asynchronous Access to Two Data Registers and One status Register
  - Software compatibility with the 8042
  - Support PS/2 mouse
  - Support port 92
  - Support both interrupt and polling modes
  - Fast Gate A20 and Hardware Keyboard Reset
  - 8 Bit Timer/ Counter
  - Support binary and BCD arithmetic
  - 6 MHz, 8 MHz, 12 MHz, or 16 MHz operating frequency
- **Serial Flash ROM Interface**
  - Support up to 8M bits flash ROM
- **General Purpose I/O Ports**
  - 48 programmable general purpose I/O ports
  - GPIO port 1 and 4 can not only serve as simple I/O ports but also watch dog timer output, Power LED output, Suspend LED output
  - Functional in power down mode (GP24 ~ GP27, GPIO-3, GPIO-4, GPIO-5)
- **OnNow Functions**

- Keyboard Wake-Up by programmable keys
- Mouse Wake-Up by programmable buttons
- On Now Wake-Up from all of the ACPI sleeping states (S1-S5)

- **Hardware Monitor Functions**
  - Smart Fan control system, support SMART FANTM I - “Thermal CruiseTM” and “Speed CruiseTM” Mode , SMART FANTM III function
  - 3 thermal inputs from optionally remote thermistors or PentiumTM II/III/4 thermal diode output
  - 10 voltage inputs (CPUVCORE, VIN[0..4] and intrinsic 3VCC, AVCC , 3VSB, VBAT)
  - 5 fan speed monitoring inputs
  - 4 fan speed control
  - Dual mode for fan control (PWM & DC)
  - Build in case open detection circuit
  - Programmable hysteresis and setting points for all monitored items
  - Over temperature indicate output
  - Issue SMI#, OVT# to activate system protection
  - Winbond Hardware DoctorTM Support
  - 6 VID inputs / outputs
  - Provide I2C interface to read/write registers
- **Package**
  - 128-pin PQFP

2.6 Ethernet Controller

The Realtek RTL8100C is a single-chip Fast Ethernet controller. It is enhanced with an ACPI (Advanced Configuration Power Interface) management function for PCI in order to provide efficient power management for advanced operating systems with OSPM (Operating System Directed Power Management). The RTL8100C also supports remote wake-up (including AMD Magic Packet™ and Microsoft® Wake-up frame). Realtek RTL8100C features are listed below.

- 128-pin PQFP/LQFP
- Supports PCI/mini-PCI interfaces
- Integrates Fast Ethernet MAC, physical chip, and transceiver onto a single chip

- 10Mbps and 100Mbps operation
- Supports 10Mbps and 100Mbps N-way auto-negotiation
- Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- Complies with PC99/PC2001 standards
- Supports ACPI power management
- Provides PCI bus master data transfer
- Provides PCI memory space or I/O space mapped data transfer
- Supports PCI clock speed of 16.75MHz-40MHz
- Advanced power saving mode
- Supports Wake-on-LAN and remote wake-up (AMD Magic Packet™, Link Change, and Microsoft® Wake-up frame)
- Half/Full duplex capability
- Supports Full Duplex Flow Control (IEEE 802.3x)
- Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- Provides PCI clock run pin
- Provides LED pins for network operation status indication
- 2.5/3.3V power supply with 5V tolerant I/Os
- 0.25µm CMOS process

2.7 Drive Interfaces

The KINO-LX can support the following drive interfaces.

- 2 x SATA drives
- 2 x IDE devices
- 1 x FDD

2.7.1 SATA Drive Interface

The KINO-LX supports two, first generation SATA drives with transfer rates of up to 150Mb/s.

2.7.2 IDE HDD Interface

The KINO-LX system chipset IDE controller supports up to two HDDs with the following specifications:

- 100 MB/second IDE Controller in UDMA mode per the ATA-6 specification

2.7.3 Floppy Disk Drive (FDD) Interface

The KINO-LX supports a single FDD. The following FDD formats are compatible with the board.

- 5.25”: 360KB and 1.2MB
- 3.5”: 720KB, 1.44MB and 2.88MB

2.8 Serial Ports

The KINO-LX CPU Board has six high-speed UART serial ports, configured as CN1, CN3 and CN14 through CN17. The serial ports have the following specifications.

- 16C550 UART with 16/32 byte selectable FIFO buffer
- 115.2Kbps transmission rate

2.9 Audio Codec

The KINO-LX has an integrated REALTEK ALC203 CODEC. The ALC203 is a 20-bit DAC and 18-bit ADC full-duplex AC'97 2.3 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio, and AMR/CNR based designs. ALC203 features are listed below.

- Single chip with high S/N ratio (>100 dB)
- Meets performance requirements for audio on PC2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 20-bit DAC and 18-bit ADC resolution
- 18-bit Stereo full-duplex CODEC with independent and variable sampling rate
- Complies with AC'97 2.3 specifications
  - LINE/HP-OUT, MIC-IN and LINE-IN sensing
  - 14.318MHz -> 24.576MHz PLL saves crystal

  - 12.288MHz BITCLK input can be consumed
  - Integrated PCBEEP generator to save buzzer
  - Interrupt capability
  - Page registers and Analog Plug & Play
- Support of S/PDIF out is fully compliant with AC'97 rev2.3 specifications
- Three analog line-level stereo inputs with 5-bit volume control: LINE_IN, CD, AUX
- High quality differential CD input
- Two analog line-level mono input: PCBEEP, PHONE-IN
- Supports double sampling rate (96KHz) of DVD audio playback
- Two software selectable MIC inputs
- +6/12/20/30dB boost preamplifier for MIC input
- Stereo output with 6-bit volume control
- Mono output with 5-bit volume control
- Headphone output with 50mW/20Ohm amplifier
- 3D Stereo Enhancement
- Multiple CODEC extension capability
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Stereo MIC record for AEC/BF application
- DC Voltage volume control
- Auxiliary power to support Power Off CD
- Adjustable VREFOUT control
- 2 GPIO pins with smart GPIO volume control
- 2 Universal Audio Jacks (UAJ)® for front panel
- Supports 32K/44.1K/48K/96KHz S/PDIF output
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-Pin LQFP Package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D Positional Audio
- Sensaura™ 3D Enhancement (optional)
- 10 Bands of Software Equalizer

- Voice Cancellation and Key Shifting in Karaoke mode
- AVRack® Media Player

2.10 Real Time Clock

256-byte battery backed CMOS RAM

2.11 System Monitoring

The KINO-LX motherboard is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +5V, and +12V
- CPU and board temperatures (by the corresponding embedded sensors)

2.12 BIOS

The KINO-LX uses a licensed copy of Phoenix Award BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot E**x**ecution **E**nvironment) support
- USB booting support

2.13 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the KINO-LX motherboard are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling heat sink is installed on the CPU. Thermal paste is smeared on the lower side of the heat sink before it is mounted on the CPU.

2.14 Power Consumption

Table 2-2 shows the power consumption parameters for the KINO-LX when an AMD LX-800 CPU is running with a 333 MHz, 256MB DDR RAM module.

Voltage	Current
+5V	1.45A
+12V	0.08A

Table 2-2: Power Consumption

2.15 PXE: Pre-Boot Execution Environment

PXE is an open industry standard developed by a number of software and hardware vendors. IEI BIOS PXE feature allows a workstation to boot from a server on a network by receiving a pre-OS agent prior to booting the operating system on the local hard drive.

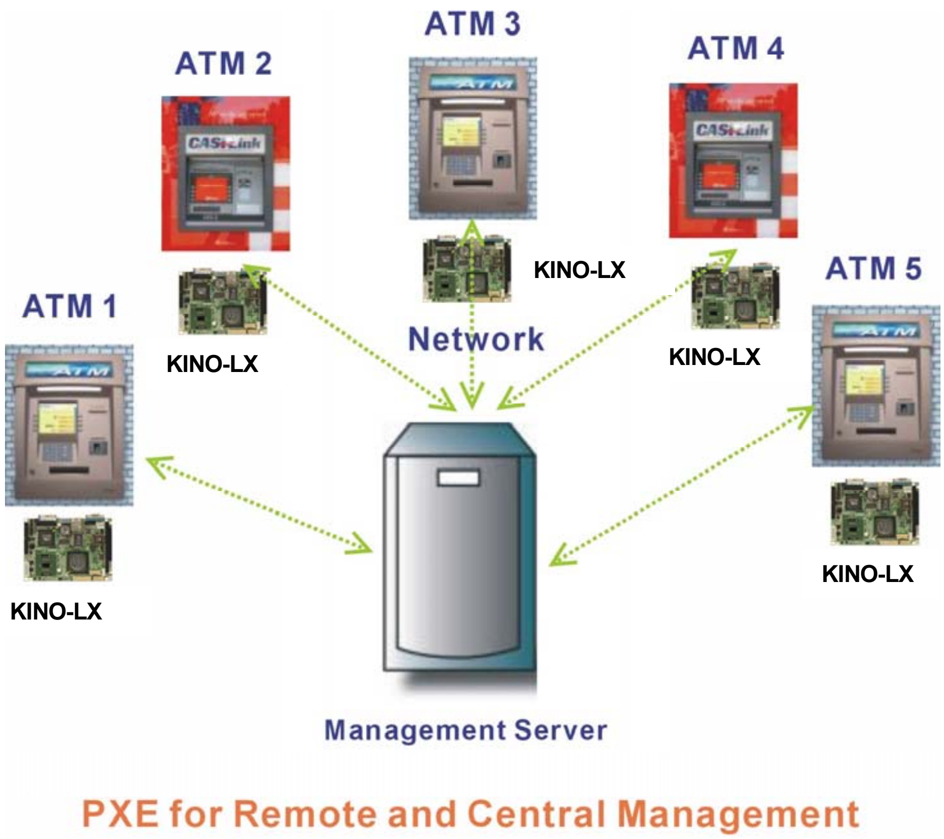


Figure 2-2: PXE: Pre-Boot Execution Environment

2.16 Packaged Contents and Optional Accessory Items

2.16.1 Package Contents

When you unpack the KINO-LX motherboard, you should find the following components.

- 1 x KINO-LX single board computer
- 1 x Mini jumper pack
- 1 x ATA66/100 flat cable
- 2 x Dual RS-232 cables
- 2 x SATA cables
- 1 x SATA Power cable
- 1 x I/O Shielding
- 1 x Utility CD
- 1 x QIG (quick installation guide)

2.16.2 Optional Accessory Items

The items shown in the list below are optional accessory items purchased separately.

- RS-23/422/485 cable

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Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

Section **3.1.1** shows peripheral interface connector locations. Section **3.1.2** lists all the peripheral interface connectors seen in Section **3.1.1**.

3.1.1 KINO-LX Layout

Figure 3-1 shows the on-board peripheral connectors and on-board jumpers.

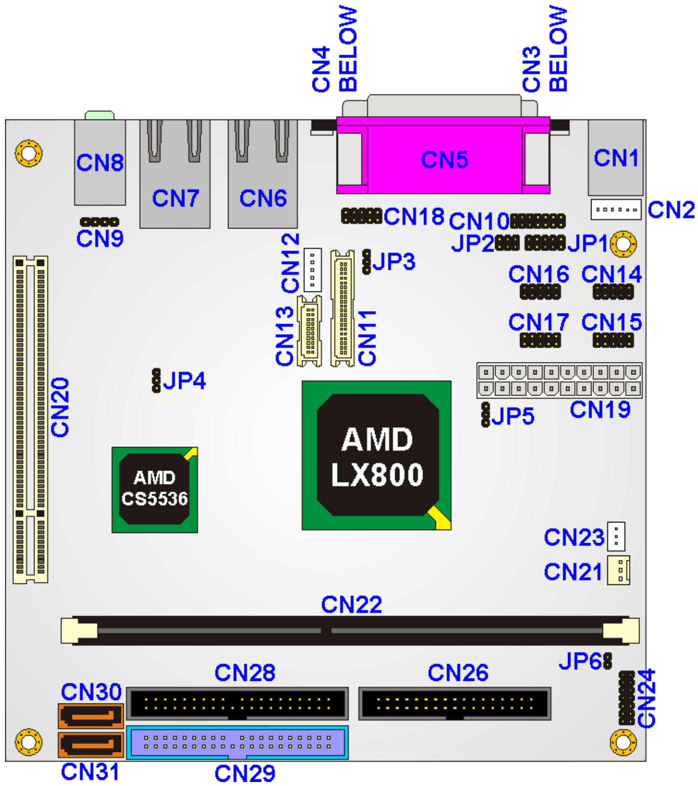


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the KINO-LX. Detailed descriptions of these connectors can be found in **Section 3.2**.

Connector	Type	Label
AT/ATX power connector	20-pin header	CN19
CD-IN connector	4-pin header	CN9
DIMM socket	184-pin socket	CN22
5V Fan connector	3-pin box header	CN23
12V Fan connector	3-pin header	CN21
FDD connector	34-pin box header	CN26
Front Panel connector	14-pin header	CN24
GPIO connector	10-pin header	CN18
IDE Interface connector (Primary)	40-pin box header	CN29
IDE Interface connector (Secondary)	40-pin box header	CN28
Inverter Power connector	5-pin wafer connector	CN12
Keyboard/Mouse connector	6-pin wafer connector	CN2
LCD TTL connector	40-pin crimp connector	CN11
LCD LVDS connector	20-pin crimp connector	CN13
PCI slot	128-pin PCI slot	CN20
RS-232/485 COM-2 serial port connector	14-pin header	CN10
RS-232 COM-3 serial port connector	10-pin header	CN14
RS-232 COM-4 serial port connector	10-pin header	CN15
RS-232 COM-5 serial port connector	10-pin header	CN16
RS-232 COM-6 serial port connector	10-pin header	CN17
SATA-1 drive connector	7-pin SATA connector	CN30
SATA-2 drive connector	7-pin SATA connector	CN31

Table 3-1: Peripheral Interface Connectors

3.1.3 External Peripheral Interface Connectors

Table 3-2 lists the external peripheral interface connectors on the KINO-LX. Detailed descriptions of these connectors can be found in **Section 3.3**.

Connector	Type	Label
Audio connector	2 x audio jacks	CN8
Ethernet and USB combo connector	RJ-45 and USB 2.0 connectors	CN6
Ethernet and USB combo connector	RJ-45 and USB 2.0 connectors	CN7
Keyboard/mouse connector	Dual PS/2 connector	CN1
Parallel port	DB-25 female connector	CN5
RS-232 serial port connector	D-sub 9 male connector	CN3
VGA connector	HD-D-sub 15 female connector	CN4

Table 3-2: Rear Panel Connectors

3.1.4 On-board Jumpers

Table 3-3 lists the on-board jumpers. Detailed descriptions of these jumpers can be found in **Section 4.5**.

Description	Label	Type
Clear CMOS	JP4	3-pin header
LCD voltage select	JP3	3-pin header
COM2 RS-232/422/485 select	JP2	6-pin header
COM1/2 RI and voltage select	JP1	10-pin header
LCD clock setup	JP5	3-pin header
AT/ATX power mode select	JP6	2-pin header

Table 3-3: On-board Jumpers

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal peripheral connectors on the KINO-LX.

3.2.1 AT/ATX Power Connector

CN Label: **CN19**

CN Type: 20-pin connector

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-4**

The ATX Power connector is connected to an ATX or AT power supply.

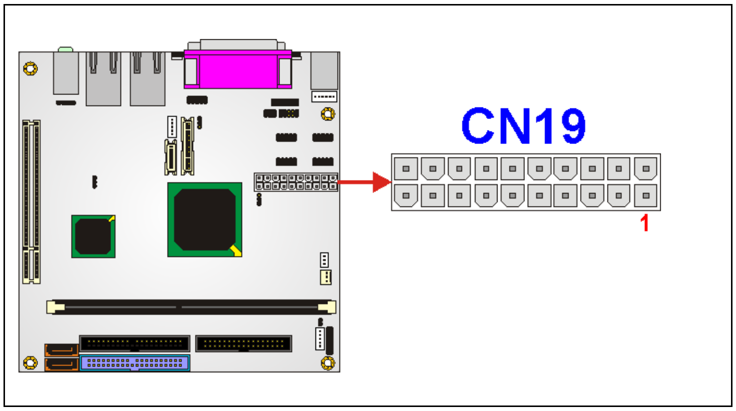


Figure 3-2: AT/ATX Power Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
11	NC	1	NC
12	-12V	2	NC
13	GND	3	GND
14	PSON	4	+5V
15	GND	5	GND
16	GND	6	+5V
17	GND	7	GND
18	NC	8	PW-OK
19	+5V	9	+5VSB
20	+5V	10	+12V

Table 3-4: AT/ATX Power Connector Pinouts

3.2.2 CD-IN Connector

CN Label: **CN9**

CN Type: 4-pin header

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-5**

The CD-In connector connects to audio sources such as CD/DVD-ROM optical drives.

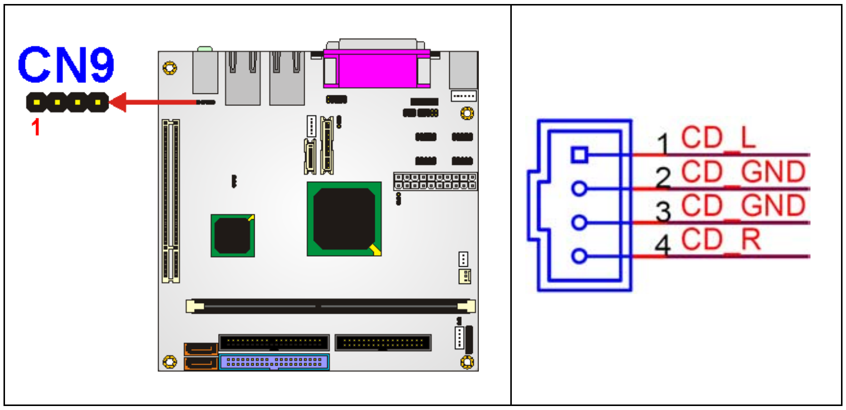


Figure 3-3: CD-IN Connector Pinout Locations

PIN	DESCRIPTION
1	CD-L
2	GND
3	GND
4	CD-R

Table 3-5: CD-IN Connector Pinouts

3.2.3 5V Fan Connector

CN Label: **CN23**

CN Type: 3-pin wafer

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-6**

The cooling fan connector provides a 5V current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

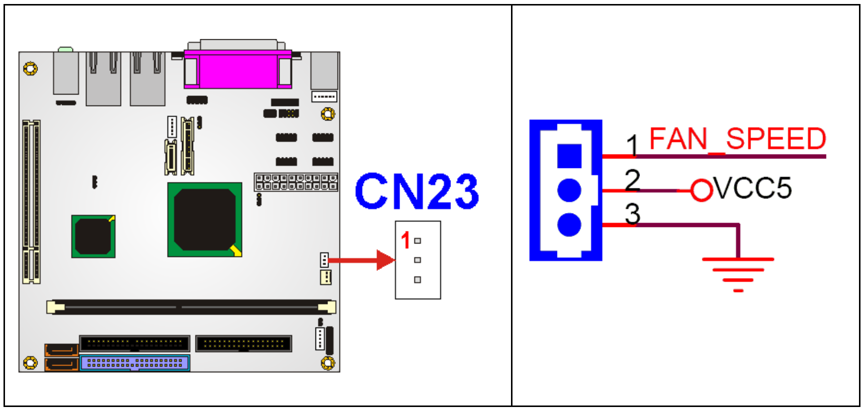


Figure 3-4: 5V Fan Connector Pinout Locations

PIN	DESCRIPTION
1	GND
2	+5V
3	Fan Speed Detect

Table 3-6: 5V Fan Connector Pinouts

3.2.4 12V Fan Connector

CN Label: **CN21**

CN Type: 3-pin wafer

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-7**

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

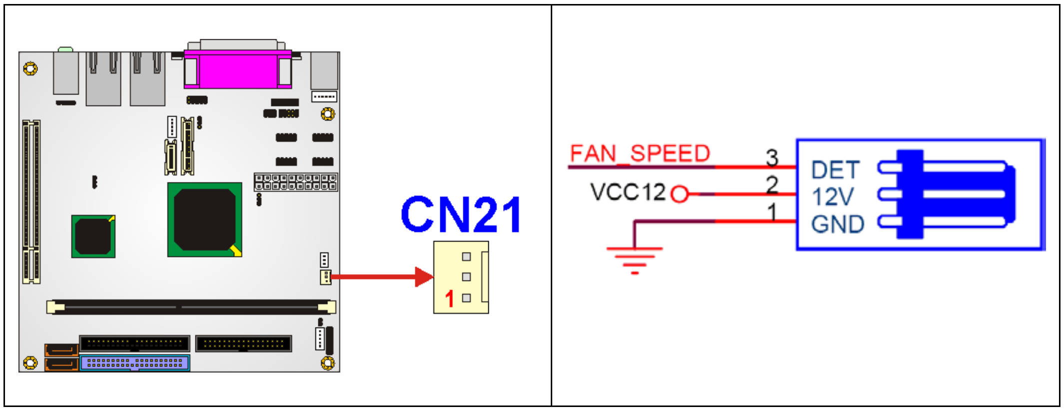


Figure 3-5: Fan Connector Pinout Locations

PIN	DESCRIPTION
1	GND
2	+12V
3	Fan Speed Detect

Table 3-7: Fan Connector Pinouts

3.2.5 Floppy Disk Connector

CN Label: **CN26**

CN Type: 34-pin box header

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-8**

The floppy disk connector connects to a floppy disk drive.

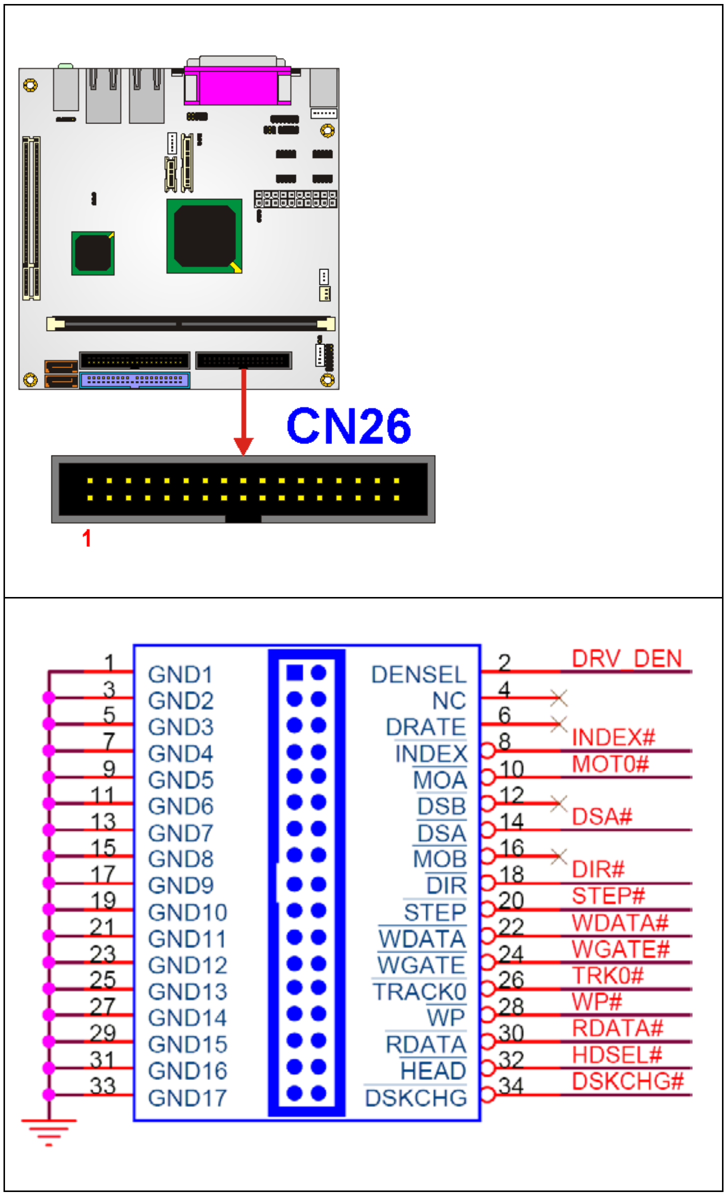


Figure 3-6: FDD Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	DENSEL
3	GND	4	NC
5	GND	6	NC
7	GND	8	INDEX#
9	GND	10	MOA#
11	GND	12	NC
13	GND	14	DSA#
15	GND	16	NC
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRACK0#
27	GND	28	WP#
29	GND	30	RDATA#
31	GND	32	HEAD#
33	GND	34	DSKCHG#

Table 3-8: FDD Connector Pinouts

3.2.6 Front Panel Connector

CN Label: **CN24**

CN Type: 14-pin header (2x7 pins)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-9**

The front panel connector connects to several external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Speaker

- Power LED
- HDD LED

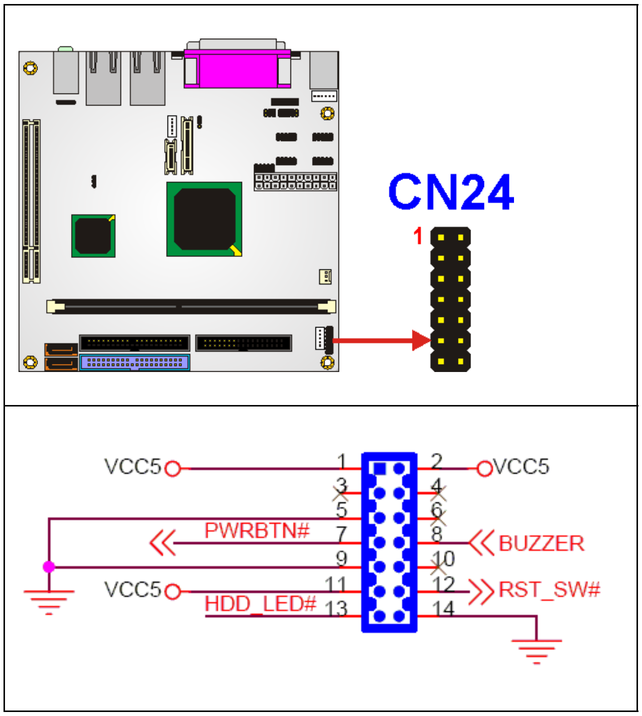


Figure 3-7: Front Panel Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	PWRLED+	2	Buzzer+(+5V)
3	NC	4	NC
5	PWRLED-	6	NC
7	PWRBTN#	8	Buzzer-
9	GND	10	NC
11	HDDLED+	12	SYS_RST#
13	HDDLED-	14	GND

Table 3-9: Front Panel Connector Pinouts

3.2.7 GPIO Connector

CN Label: **CN18**

CN Type: 10-pin header (2x5 pins)

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-10**

The General Purpose Input Output (GPIO) connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

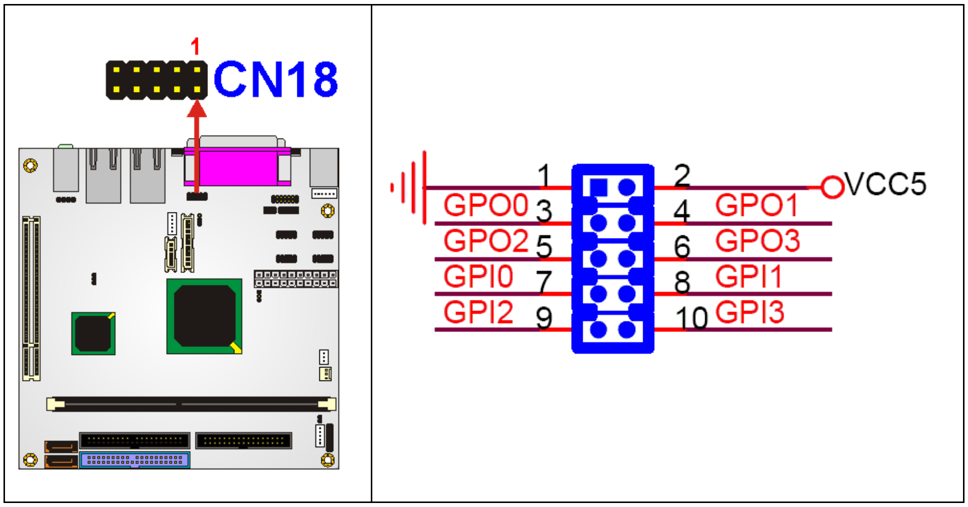


Figure 3-8: GPIO Connector Pinout Locations

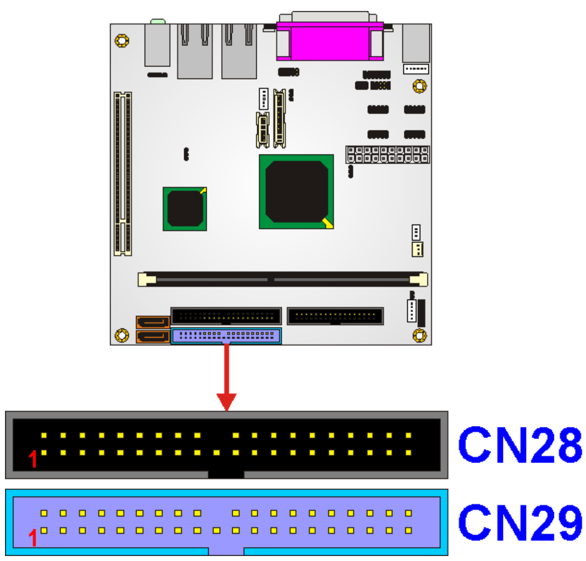
PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	+5V
3	GPO0	4	GPO1
5	GPO2	6	GPO3
7	GPI0	8	GPI1
9	GPI2	10	GPI3

Table 3-10: GPIO Connector Pinouts

3.2.8 IDE Connectors

CN Label:	**CN29 (Primary)** and **CN28 (Secondary)**
CN Type:	40-pin header (2x20)
CN Location:	See **Figure 3-9**
CN Pinouts:	See **Table 3-11**

Two 40-pin IDE device connectors on the KINO-LX motherboard supports connectivity to Ultra ATA/133 IDE devices with data transfer rates up to 133MB/s.



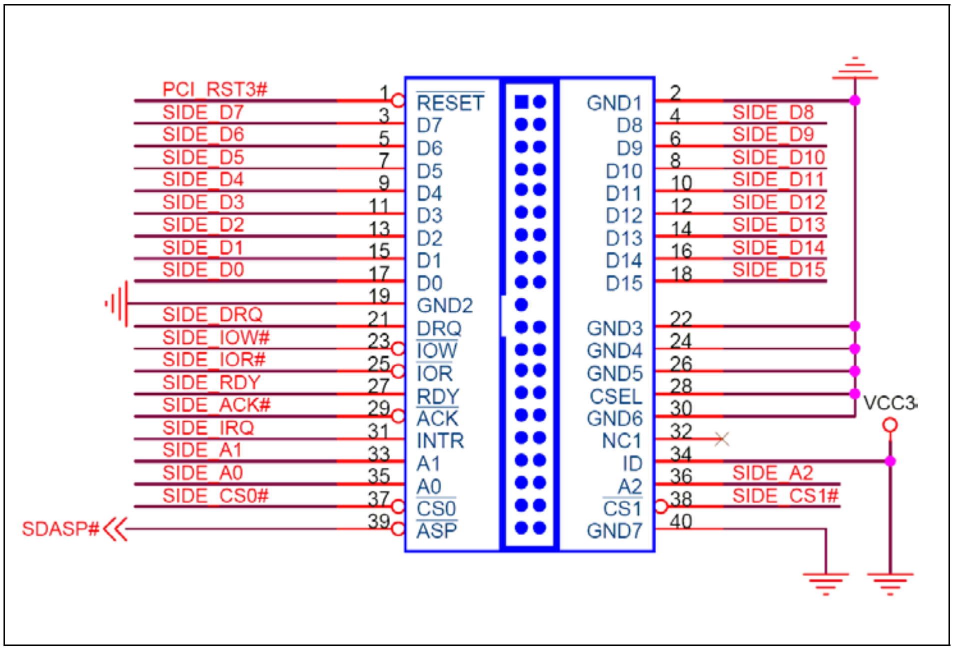


Figure 3-9: IDE Device Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	RDY	28	NC
29	ACK#	30	GND
31	INT	32	NC
33	A1	34	CABLEID
35	A0	36	A2
37	CS0#	38	CS1#
39	ASP#	40	GND

Table 3-11: IDE Connector Pinouts

3.2.9 Inverter Power Connector

CN Label: **CN12**

CN Type: 5-pin wafer

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-12**

The inverter connector is connected to the LCD backlight.

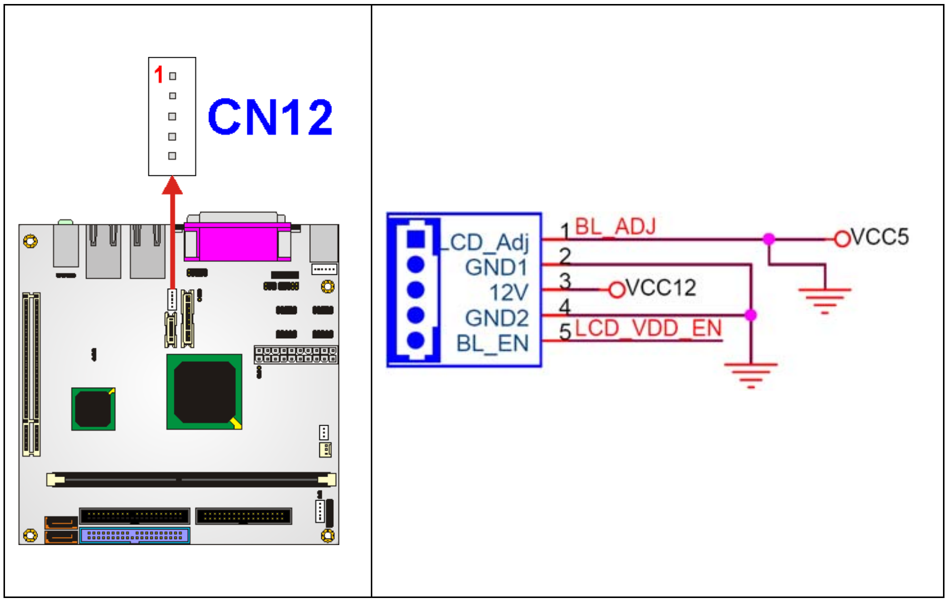


Figure 3-10: Inverter Connector Locations

PIN	DESCRIPTION
1	ADJ (Def : GND)
2	GND
3	+12V
4	GND
5	BL_EN

Table 3-12: Inverter Power Connector Pinouts

3.2.10 Keyboard/Mouse Connector

CN Label: **CN2**

CN Type: 6-pin wafer

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-13**

For alternative applications, an on board keyboard/mouse pin header connector is also available.

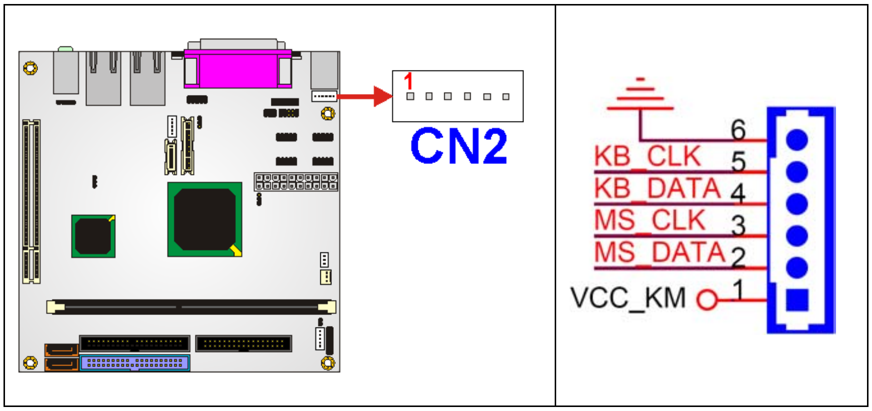


Figure 3-11: Keyboard/Mouse Connector Location

PIN	DESCRIPTION
1	+5V
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	GND

Table 3-13: Keyboard/Mouse Connector Pinouts

3.2.11 LCD LVDS Connector

CN Label:	**CN13**
CN Type:	20-pin crimp connector
CN Location:	See **Figure 3-12**
CN Pinouts:	See **Table 3-14**

The LCD LVDS connector is connected to a LCD LVDS display device.

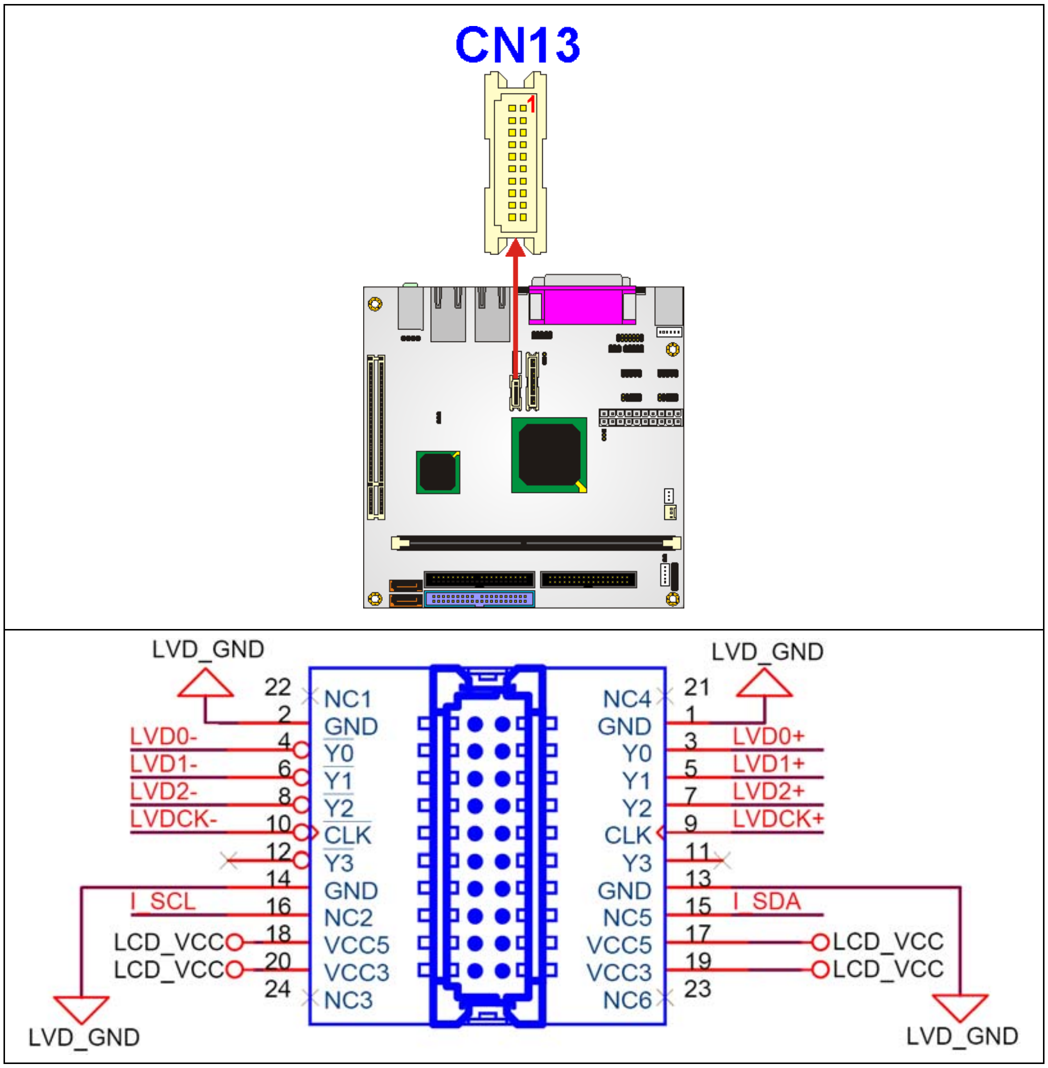


Figure 3-12: LCD LVDS Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
2	GND	1	GND
4	D0-	3	D0+
6	D1-	5	D1+
8	D2-	7	D2+
10	CLK-	9	CLK+
12	NC	11	NC
14	GND	13	GND
16	SCL	15	SDA
18	LCD_VCC	17	LCD_VCC
20	LCD_VCC	19	LCD_VCC

Table 3-14: LCD LVDS Connector Pinouts

3.2.12 LCD TTL Connector

CN Label: **CN11**

CN Type: 40-pin crimp connector

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-15**

The LCD TTL connector is connected to a LCD TTL display device.

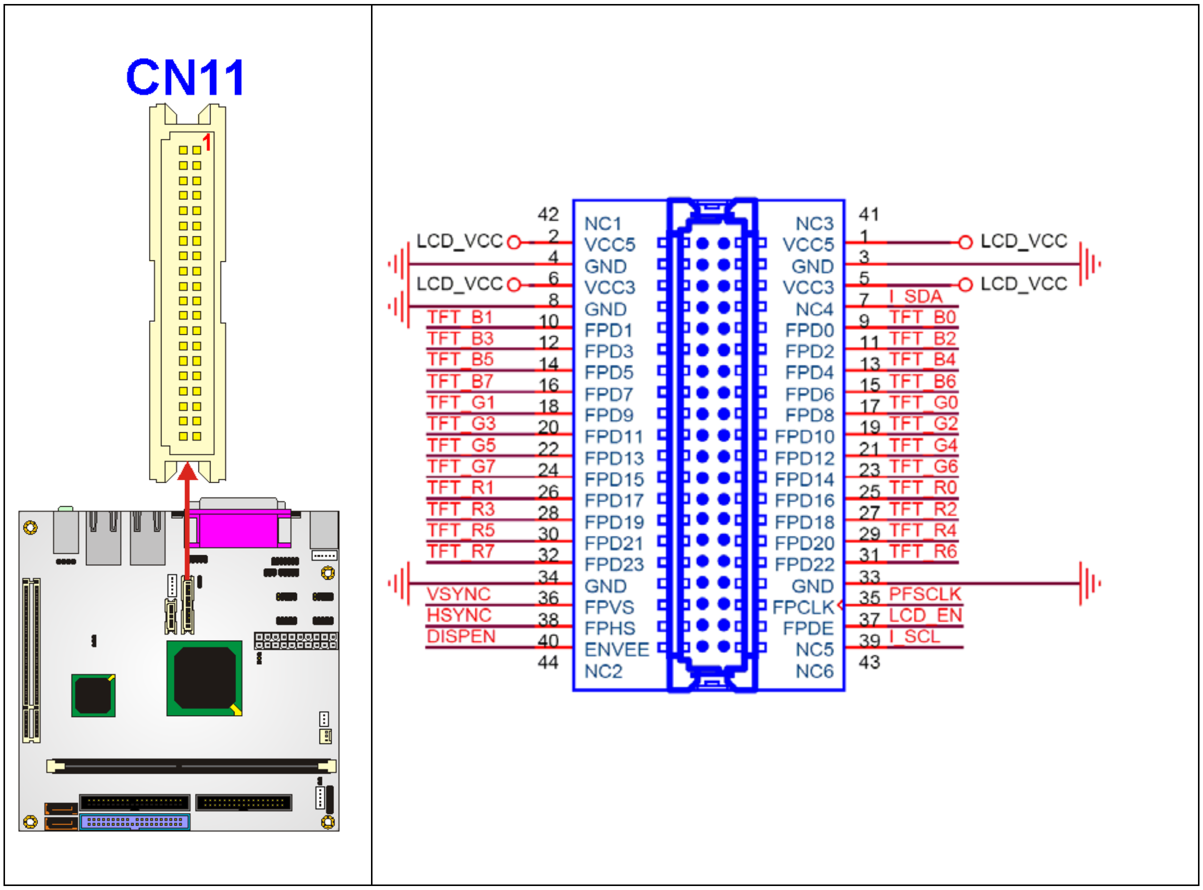


Figure 3-13: LCD TTL Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
2	LCD_VCC	1	LCD_VCC
4	GND	3	GND
6	LCD_VCC	5	LCD_VCC
8	GND	7	SDA
10	B1	9	B0
12	B3	11	B2
14	B5	13	B4
16	B7	15	B6
18	G1	17	G0
20	G3	19	G2
22	G5	21	G4
24	G7	23	G6
26	R1	25	R0
28	R3	27	R2
30	R5	29	R4
32	R7	31	R6
34	GND	33	GND
36	VSYNC	35	CLK
38	HSYNC	37	LCD_EN
40	DISP_EN	39	SCL

Table 3-15: LCD TTL Connector Pinouts

3.2.13 PCI Slot

CN Label: **CN20**

CN Type: PCI slot

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-16**

The PCI slot enables a PCI expansion module to be connected to the board.

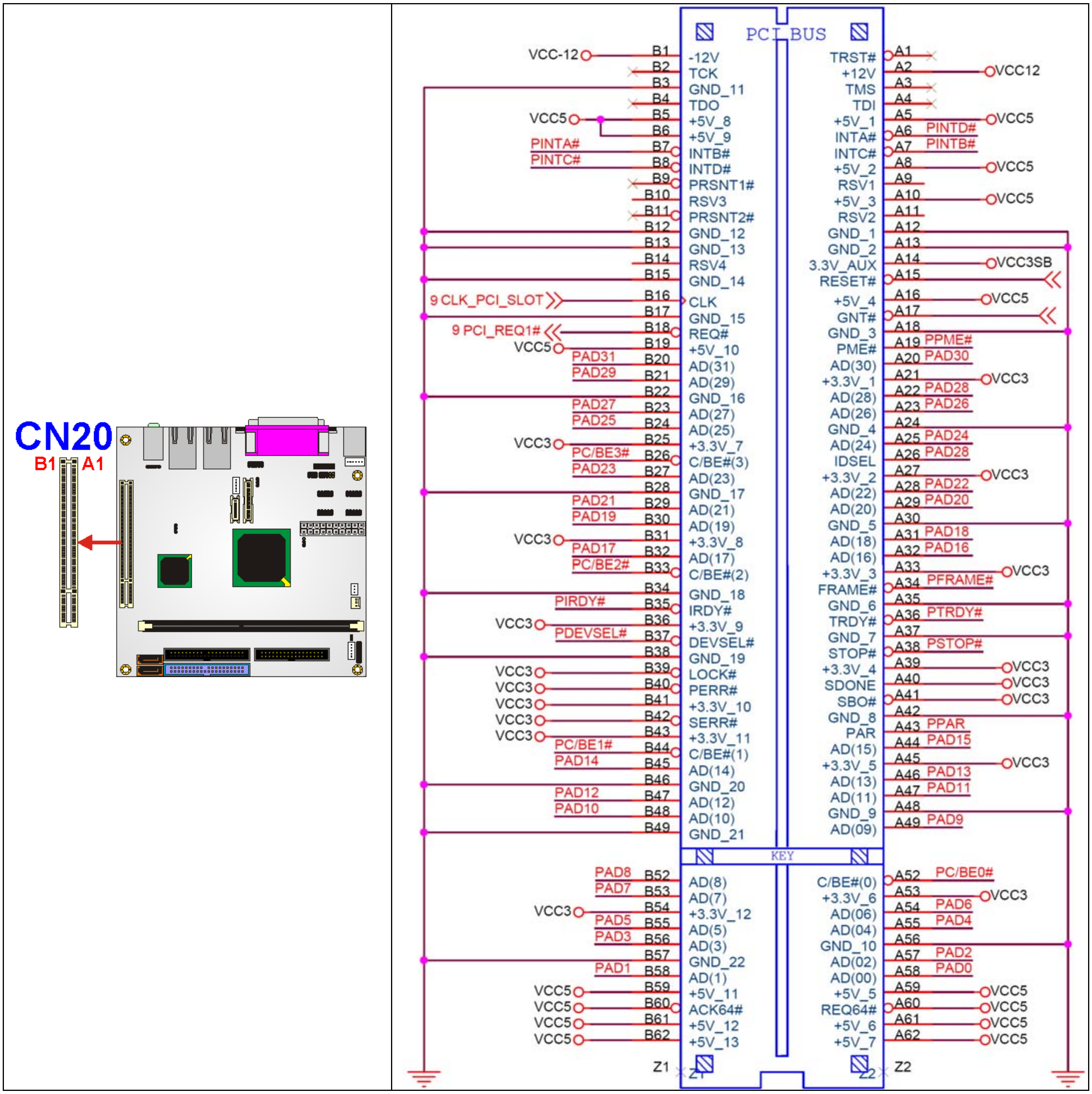


Figure 3-14: PCI Slot Location

PIN	DESCRIPTION	PIN	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK

PIN	DESCRIPTION	PIN	DESCRIPTION
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17
A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND

PIN	DESCRIPTION	PIN	DESCRIPTION
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V
A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 3-16: PCI Slot

3.2.14 RS-232/422/485 Serial Port Connector

CN Label: **CN10**

CN Type: 2x7 pin header

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-17**

The CN10 serial port connector connects to an RS-232 or RS-485 serial port devices.

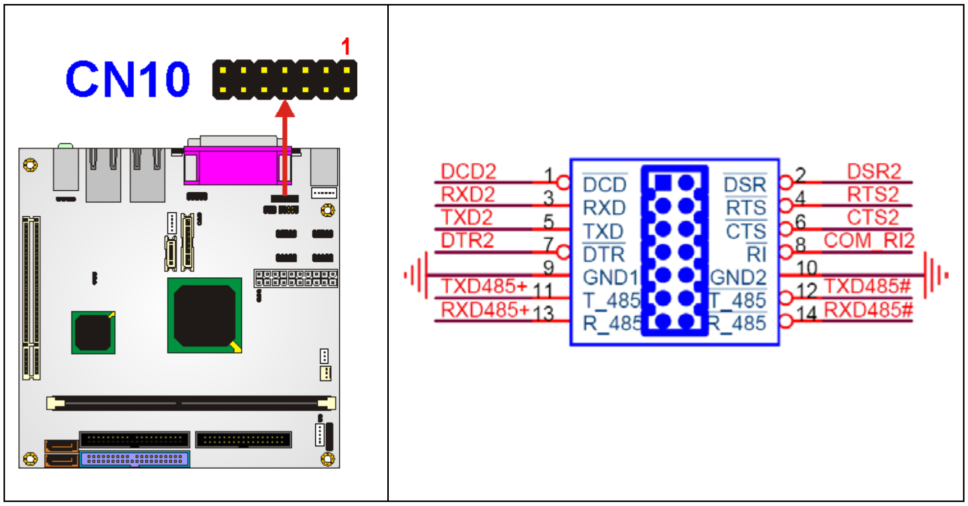


Figure 3-15: RS-232/422/485 Serial Port Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD#	2	DSR#
3	RxD	4	RTS#
5	TxD	6	CTS#
7	DTR#	8	RI# / Vout
9	GND	10	GND
11	TxD485+	12	TxD485-
13	RxD485+	14	RxD485-

Table 3-17: RS-232/422/485 Serial Port Connector Pinouts

3.2.15 RS-232 COM Serial Port Connector

CN Label: **COM3**, **COM4**, **COM5** and **COM6**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-18**

The COM3, COM4, COM5 and COM6 serial port connectors connect to RS-232 serial port devices.

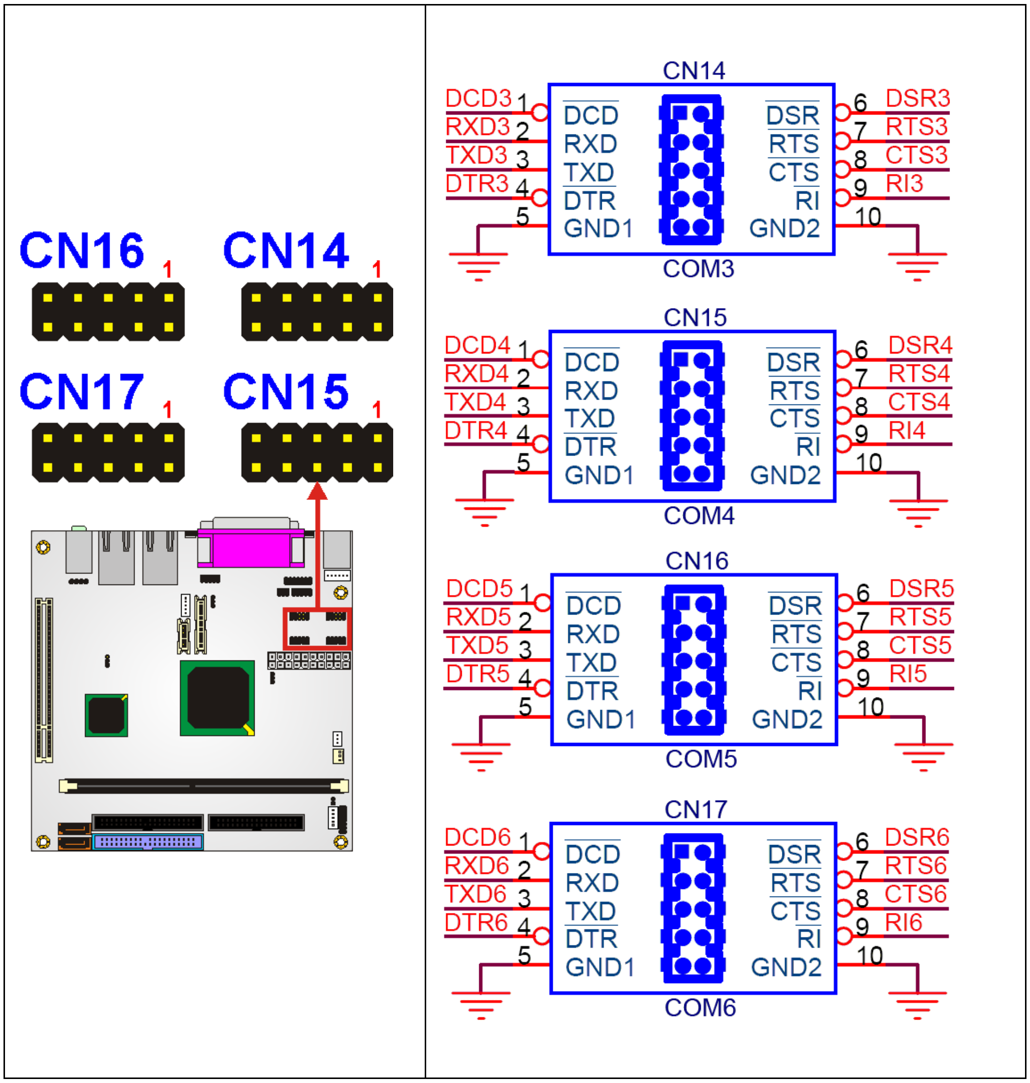


Figure 3-16: RS-232 Serial Port Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	GND

Table 3-18: RS-232 Serial Port Connector Pinouts

3.2.16 SATA Drive Connectors

CN Label: **CN30** and **CN31**

CN Type: 1x7 pin SATA drive connectors

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-19**

The two SATA drive connectors are connected to two first generation SATA drives. First generation SATA drives transfer data at speeds as high as 150Mb/s.

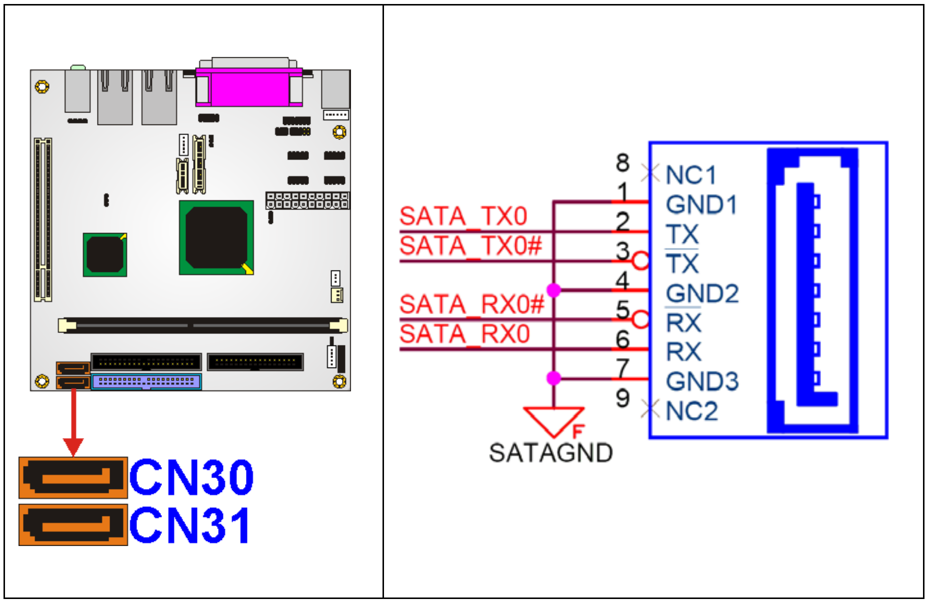


Figure 3-17: SATA Drive Connector Pinout Locations

PIN	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-19: SATA Drive Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-18 shows the KINO-LX external peripheral interface connector panel. The peripheral connectors are connected to external devices when the KINO-LX is installed in a chassis. The peripheral connectors on the panel are:

- 1 x PS/2 keyboard and mouse connector
- 1 x Serial port connector
- 1 x Parallel port connector
- 1 x VGA connector
- 2 x RJ-45 GbE connector
- 4 x USB connectors
- 1 x Audio connector (two audio jacks)

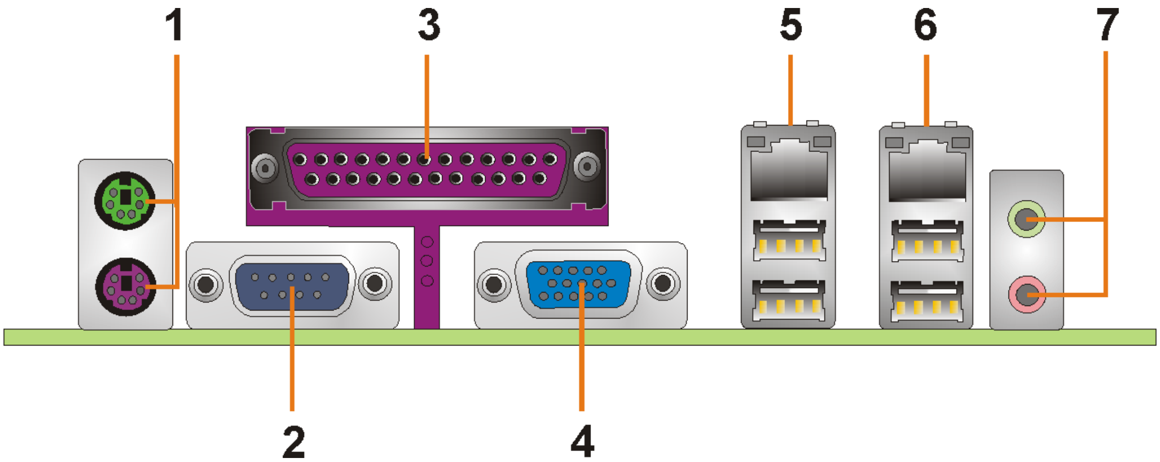


Figure 3-18: KINO-LX External Peripheral Interface Connector Panel

3.3.1 Keyboard/Mouse Connector

CN Label: **CN8**

CN Type: Dual PS/2

CN Location: See **Figure 3-18** (labeled number 1)

CN Pinouts: See **Figure 3-19** and **Table 3-20**

The KINO-LX keyboard and mouse connectors are standard PS/2 connectors.

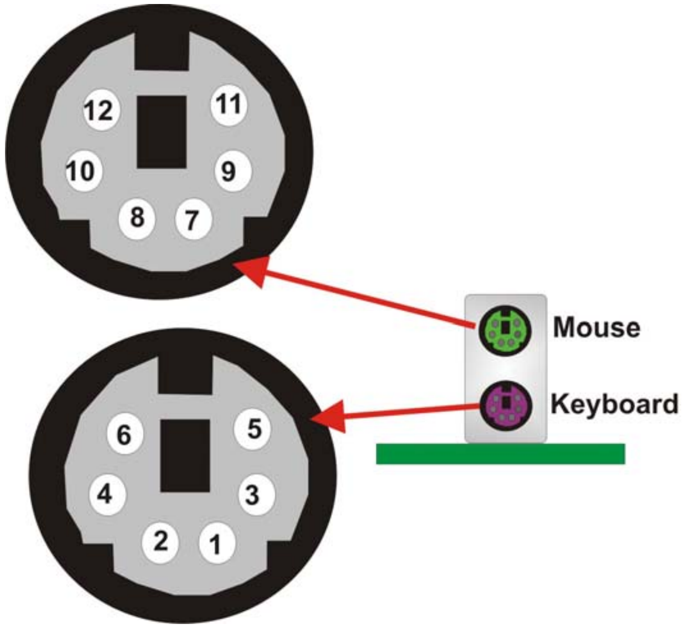


Figure 3-19: Keyboard/Mouse Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 3-20: Keyboard/Mouse Connector Pinouts

3.3.2 Serial Port Connector

CN Label: **CN3**

CN Type: D-sub 9 male connector

CN Location: See **Figure 3-18** (labeled number 2)

CN Pinouts: See **Figure 3-20** and **Table 3-21**

The KINO-LX has an RS-232 serial port on the external peripheral interface connector panel.

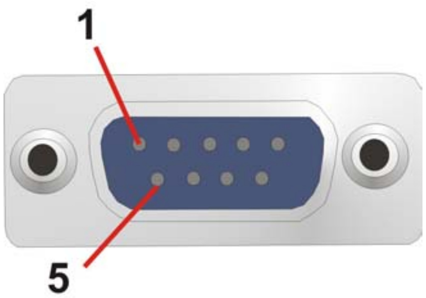


Figure 3-20: Serial Port Connector

Serial port connector (COM1) pinouts are shown below.

PIN	Description	PIN	Description
1	DCD1	6	DSR1
2	RXD1	7	RTS1
3	TXD1	8	CTS1
4	DTR1	9	RI1
5	GROUND		

Table 3-21: Serial Port Connector Pinouts

3.3.3 Parallel Port Connector

CN Label: **CN5**

CN Type: DB-25 female connector

CN Location: See **Figure 3-18** (labeled number 3)

CN Pinouts: See **Figure 3-21 and Table 3-22**

The KINO-LX has one parallel port on the external peripheral interface connector panel to connect to a printer or other parallel communication devices.

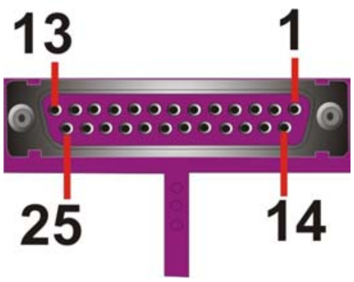


Figure 3-21 Parallel Port Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STB#	14	AFD#
2	PD0	15	ERR#
3	PD1	16	INIT#
4	PD2	17	SLIN#
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		

Table 3-22: Parallel Port Pinouts

3.3.4 VGA connector

CN Label: **CN4**

CN Type: HD-D-sub 15 female connector

CN Location: See **Figure 3-18** (labeled number 4)

CN Pinouts: See **Figure 3-22** and **Table 3-23**

A 15-pin VGA connector connects to standard displays.

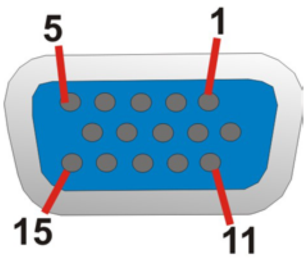


Figure 3-22: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	9	NC
2	GREEN	10	GROUND
3	BLUE	11	NC
4	NC	12	DDCDAT
5	GROUND	13	HSYNC
6	GROUND	14	VSYNC
7	GROUND	15	DDCCLK
8	GROUND		

Table 3-23: VGA Connector Pinouts

3.3.5 LAN Connectors

CN Label: **CN6** and **CN7**

CN Type: RJ-45

CN Location: See **Figure 3-18** (labeled number 5 and 6)

CN Pinouts: See **Table 3-24**

The KINO-LX is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+2.5VCC	2	TX0+
3	TX0-	4	TX1+
5	TX1-	6	TX2+
7	TX2-	8	TX3+
9	TX3-	10	GND
11	LINK-	12	LINK+
13	ACTIVE-	14	ACTIVE+

Table 3-24: LAN Pinouts

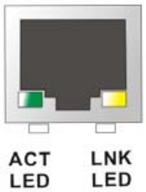


Figure 3-23: RJ-45Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow (**Figure 3-23**). The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-25**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-25: RJ-45 Ethernet Connector LEDs

3.3.6 USB Connectors

CN Label: **CN6** and **CN7**

CN Type: USB port

CN Location: See **Figure 3-18** (labeled number 5 and 6)

CN Pinouts: See **Table 3-26**

The KINO-LX has a four rear panel USB ports. These ports connect to both USB 2.0 and USB 1.1 devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBV3L 5V	2	GND
3	USBP4N	4	USBP5P
5	USBP4P	6	USBP5N
7	GND	8	USBV3L 5V

Table 3-26: USB Port Pinouts

3.3.7 Audio Connector

CN Label: **CN1**

CN Type: 2 x audio jacks

CN Location: See **Figure 3-18** (labeled number 7)

CN Pinouts: See **Figure 3-24**

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

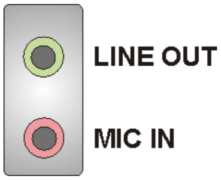


Figure 3-24: Audio Connector

Chapter 4

Installation

4.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-LX. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the KINO-LX (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wrist band can help to prevent ESD from damaging the board.
- ***Self-grounding***: - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the motherboard is installed. All installation notices pertaining to the installation of the Motherboard should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the motherboard and injury to the person installing the motherboard.

4.2.1 Installation Notices

Before and during the installation of the KINO-LX motherboard, please **do** the following:

- Read the user manual
  - The user manual provides a complete description of the KINO-LX motherboard, installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD)

  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the user's body and help to prevent ESD damage.

- Place the motherboard on an antistatic pad
  - When the motherboard is installed and configured, place it on an antistatic pad. This helps to prevent potential ESD damage.

- Turn off all power to the KINO-LX motherboard
  - When working with the motherboard, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-LX motherboard **DO NOT:**

- remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- use the product before all the cables and power connectors are properly connected.
- allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Unpacking

NOTE:

If any of the items listed below are missing when the KINO-LX is unpacked, do not proceed with the installation and contact the reseller or vendor motherboard was purchased from.

4.3.1 Unpacking Precautions

Some components on KINO-LX are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged during the unpacking process, follow these precautions:

- Users should ground themselves to remove any static charge before touching

the KINO-LX. To ground themselves, users can wear a grounded wrist strap at all times or frequently touching any conducting materials that is connected to the ground.

- Handle the KINO-LX by its edges. Do not touch the IC chips, leads or circuitry unnecessarily.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.3.2 Checklist

When KINO-LX is unpacked please make sure the package contains the following items.

- 1 x KINO-LX Single Board Computer
- 1 x ATA66/100 Flat Cable
- 2 x SATA Cable
- 1 x SATA Power Cable
- 1 x Dual RS-232 Cable
- 1 x I/O Shielding
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG

If one or more of these items are missing, please contact the reseller or vendor KINO-LX was purchased from and do not proceed any further with the installation.

4.4 KINO-LX Motherboard Installation

WARNING!

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the KINO-LX components and injury to the user.

WARNING!

When installing electronic components onto the KINO-LX always take anti-static precautions in order to prevent ESD damage to the KINO-LX and other electronic components like the CPU and DIMM modules

4.4.1 Preinstalled Components

The components listed below are preinstalled on the KINO-LX.

- CPU

4.4.2 Components to Install

To install the KINO-LX, the following components must be installed or connected to the KINO-LX:

- DIMM modules
- Peripheral devices

4.4.3 DIMM Module Installation

4.4.3.1 Purchasing the Memory Module

When purchasing DIMM modules, the following considerations should be taken into account: to 1GB of 333MHz or 400MHz of DDR memory

- The DIMM module can support a memory chip with a maximum size of 1GB
- The DIMM module can have a of 333MHz or 400MHz
- The DIMM can be either single-sided or dual-sided.

4.4.3.2 DIMM Module Installation

The KINO-LX motherboard has one DDR SDRAM DIMM socket. To install a DIMM module, follow the instructions below and refer to **Figure 4-1**.

Step 1: Pull the two white handles on either side of the DIMM socket down.

Step 2: Align the DIMM module with the DIMM socket making sure the matching pins are correctly aligned.

Step 3: Insert the DIMM module slowly. Once it is correctly inserted, push down firmly. The white handles on either side of the socket move back up and lock the module into the socket.

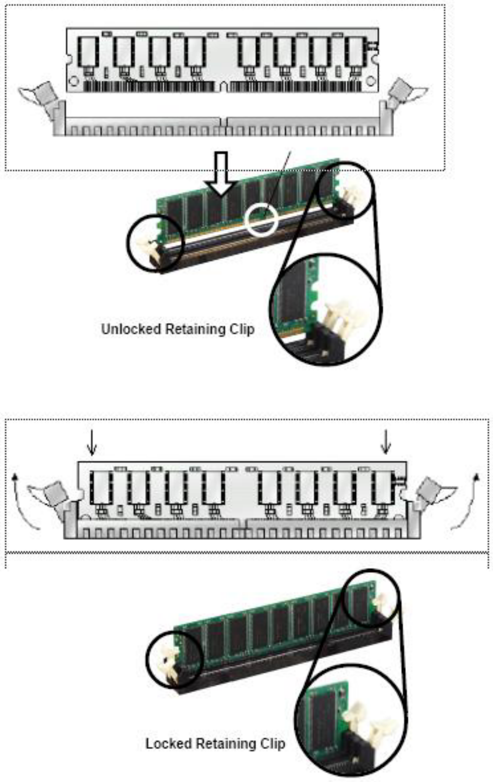


Figure 4-1: DIMM Module Installation

4.5 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the board are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

Quantity	Type
1	mini jumper pack
1	ATA 66/100 HDD cable
2	SATA cables
1	SATA power cable
1	Dual RS-232 cables

Table 4-1: IEI Provided Cables

4.5.1 IDE Disk Drive Connectors (CN29 Primary, CN28 Secondary)

The cable used to connect the CPU card to an IDE HDD is a standard 40-pin ATA66/100 flat cable. Follow the instructions below to connect an IDE HDD to the CPU card.

Step 1: Find the ATA66/100 flat cable in the kit that came with the CPU card.

Step 2: Connect one end of the cable to the CN29 (Primary IDE) connector on the CPU card. A keyed pin on the IDE connector prevents IT from being connected incorrectly.

Step 3: Locate the red wire on the cable that corresponds to the pin 1 connector.

Step 4: Connect the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.

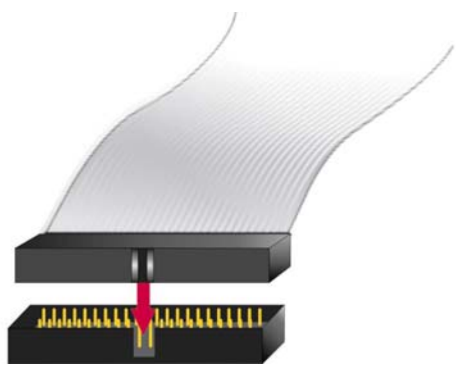


Figure 4-2: Connection of IDE1 Connector

NOTE:

When two EIDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

4.5.2 COM3-COM6 RS-232 Serial Port Installation

The cable used to connect the motherboard to an RS-232 serial port is a 10-pin header to male D-sub 9 connector. To connect an RS-232 serial port to the motherboard, follow the instructions below.

Step 1: Find the RS-232 cable in the kit that came with the motherboard.

Step 2: Connect the 10-pin connector end of the cables to the COM3 to COM6 box headers on the motherboard. Be sure to align the red wire on the connector to pin 1 on the box header.

Step 3: Connect the other end of the cables to standard female D-sub 9 connectors.

4.5.3 COM2 RS-232/485 Serial Port Installation

To connect an RS-232/485 serial port to the motherboard, follow the instructions below.

Step 1: Connect the 14-pin connector end of an RS-422/485 serial port cable to the CN10 connector on the motherboard.

NOTE:

Be sure to configure the JP2 COM2 RS232/RS485 Select Jumper for either an RS-232 or RS-485 connection. Refer to **Section 4.5** for more information.

4.5.4 LCD Backlight Installation

To connect an LCD backlight (inverter) to the motherboard, follow the instructions below.

Step 1: Connect the 5-pin connector end of the LCD backlight cable to the CN12 header on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.5.5 Power Connection

To connect the motherboard to a power supply, follow the instructions below.

Step 1: Connect a 20-pin AT/ATX power connector from a power supply to the CN19 power connector on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.5.6 LVDS LCD Installation

To connect a LVDS LCD to the motherboard, follow the instructions below.

Step 1: Connect the 20-pin connector end of a TTL LCD cable to the CN13 miniature crimping connector on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.5.7 TTL LCD Installation

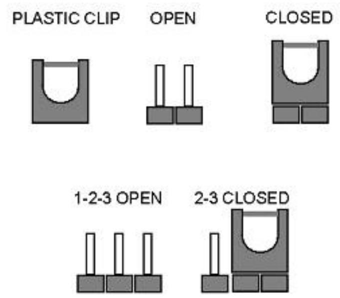
To connect a TTL LCD to the motherboard, follow the instructions below.

Step 1: Connect the 40-pin connector end of a TTL LCD cable to the CN11 miniature crimping connector on the motherboard. A keyed pin on the connector prevents it from being connected incorrectly.

4.6 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the KINO-LX is installed in the system, the jumpers must be set in accordance with the desired configuration. The KINO-LX motherboard has six on-board jumpers.

Description	Label	Type
Clear CMOS	JP4	3-pin header
LCD voltage select	JP3	3-pin header
COM2 RS-232/422/485 select	JP2	6-pin header
COM1/2 RI and voltage select	JP1	10-pin header
LCD clock setup	JP5	3-pin header
AT/ATX power mode select	JP6	2-pin header

Table 4-2: Jumpers

Figure 4-3 shows the KINO-LX jumper locations.

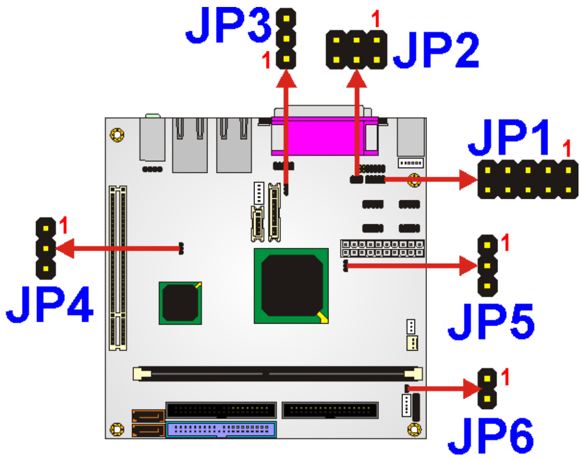


Figure 4-3: Jumper Locations

4.6.1 Clear CMOS Jumper

Jumper Label:	**JP4**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-3**

If the KINO-LX fails to boot due to improper BIOS settings, use this connector to clear the CMOS data and reset the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

Clear CMOS	DESCRIPTION
Short 1 - 2 (Default)	Keep CMOS Setup
Short 2 - 3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

4.6.2 LCD Voltage Select Jumper

WARNING:

Making the wrong setting on this jumper may cause irreparable damage to both the motherboard and the LCD screen connected to the on-board connector.

Jumper Label: **JP3**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-4**

Jumper Location: See **Figure 4-3**

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 4-4**.

JP3	DESCRIPTION
Short 1-2 (Default)	Panel Voltage select 3V
Short 2-3	Panel Voltage select 5V

Table 4-4: LCD Voltage Setup Jumper Settings

4.6.3 COM2 RS-232/422/485 Select

Jumper Label: **JP2**

Jumper Type: 6-pin header

Jumper Settings: See **Table 4-5**

Jumper Location: See **Figure 4-3**

The RS-232/422/485 select jumper sets the communication protocol used by the second serial communications port (COM2) as RS-232, RS-422 or RS-485.

JP2	DESCRIPTION
Short 1-2	RS-232
Short 3-4	RS-422
Short 5-6	RS-485

Table 4-5: COM2 RS-232/422/485 Select Settings

4.6.4 COM1/2 RI and Voltage Select Jumper

Jumper Label: **JP1**

Jumper Type: 10-pin header

Jumper Settings: See **Table 4-6**

Jumper Location: See **Figure 4-3**

This jumper allows the user to set the voltage for pin 9 on COM1 or COM2. Pin 9 is traditionally a ring line but this jumper can set pin 9 to supply 5V or 12V power to a serial device connected to COM1 or COM2. Make the necessary jumper setting in accordance with the settings shown in **Table 4-6**.

JP1	DESCRIPTION
1-3	COM1 RI Pin Use +12V
3-5	COM1 RI Pin Use +5V
7-9	COM1 RI Pin Use RI
2-4	COM2 RI Pin Use +12V
4-6	COM2 RI Pin Use +5V
8-10	COM2 RI Pin Use RI

Table 4-6: COM2 Voltage Setup Jumper Settings

4.6.5 LCD Clock Jumper

Jumper Label: JP5

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-7**

Jumper Location: See **Figure 4-3**

The LCD clock jumper sets the LCD panel shift clock.

JP5	Description
1-2	Inverted Output (Default)
2-3	Normal Output

Table 4-7: LCD Clock Jumper Settings

4.6.6 AT/ATX Power Mode Select Jumper

Jumper Label: JP6

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-8**

Jumper Location: See **Figure 4-3**

The AT/ATX power mode select jumper block controls the connection to a power supply.

The AT/ATX power connector is used to connect a chassis power On/Off button using an adapter cable and is configured through the JP6 jumper. The AT/ATX power connector has two operational modes:

1. Using **ATX** power: AT/ATX power connects to an externally implemented power switch, and the JP6 jumper should be left open.
2. Using **AT** power: The pins on JP6 are shorted by a jumper cap. JP6 should be shorted by default as the AMD Southbridge is designed without the consideration for a power button signal. The shorted JP6 provides a hardware feedback to initiate the system. The power on/off function is then managed by the AT power switch button.

JP6	Description
Short	AT Mode (Default)
Open	ATX Mode

Table 4-8: AT/ATX Power Mode Select Jumper Settings

4.7 Chassis Installation

After the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configured, the KINO-LX can be mounted into chassis.

To mount a board into a chassis, please refer to the chassis user guide that came with the product.

4.8 Rear Panel Connectors

4.8.1 Keyboard and Mouse Connection

A PS/2 keyboard and a PS/2 mouse can be connected to the appropriate PS/2 connector on the rear panel.

4.8.2 Serial Connection

The external peripheral interface connector panel serial connector provides easy and quick access to external serial devices.

4.8.3 Parallel Connector

The external parallel port connector connects to a printer. The parallel port interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. The default interrupt channel is IRQ7. Select ECP or EPP DMA mode using the BIOS configuration utility.

4.8.4 LCD Panel Connection

The conventional CRT monitor connector is a 15-pin, female D-SUB connector. It can be connected to an external monitor.

4.8.5 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 10Mbps and 100Mbps.

4.8.6 USB Connection

The rear panel USB connectors provide easier and quicker access to external USB devices. The rear panel USB connector is a standard connector and can easily be connected to other USB devices.

4.8.7 Audio Interface

AC’97 Audio signals are interfaced through two phone jack connections. The red phone jack is for Mic In and green is for Speaker Out.

Chapter 5

BIOS Settings

5.1 Introduction

A licensed copy of Phoenix Award BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The Phoenix Award BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the **PAGEUP** and **PAGEDOWN** keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown below.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+/Page up	Increase the numeric value or make changes
-/Page down	Decrease the numeric value or make changes
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Item help
F5	Previous values for the page menu items
F6	Fail-safe defaults for the current page menu items
F7	Optimized defaults for the current page menu items
F9	Menu in BIOS
F10	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

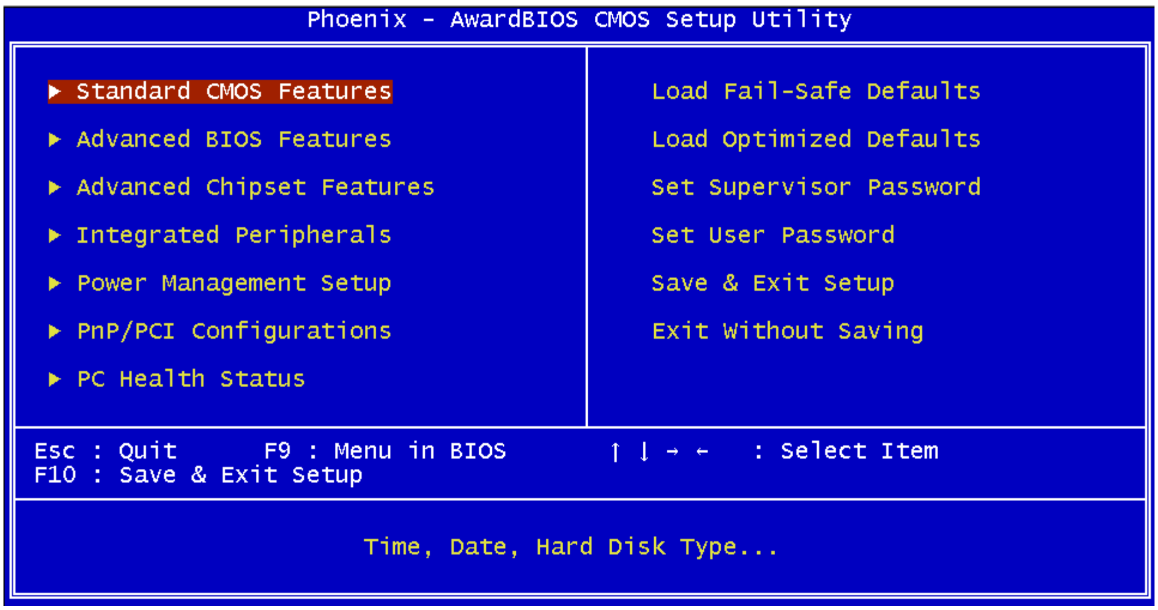
When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **ESC** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the system cannot be booted after changes are made, restore the CMOS defaults. The CPU card should come with a restore CMOS settings jumper. Refer to **Section 4.5.1** for more information.

5.1.5 Main BIOS Menu

Once the BIOS opens, the main menu (**BIOS Menu 1**) appears.



BIOS Menu 1: AwardBIOS CMOS Setup Utility

NOTE:

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS Menu 1**.

- **Standard CMOS Features**: Changes the basic system configuration.
- **Advanced BIOS Features**: Changes the advanced system settings.
- **Advanced Chipset Features**: Changes the chipset configuration features.
- **Integrated Peripherals**: Changes the settings for integrated peripherals.
- **Power Management Setup**: Configures power saving options.
- **PnP/PCI Configurations**: Changes the advanced PCI/PnP settings.
- **PC Health Status**: Monitors essential system parameters.

The following user configurable options are also available in **BIOS Menu 1**:

→ Load Fail-Safe Defaults

Select this option to load failsafe default values for each BIOS parameter in the setup menus. Press **F6** for this operation on any page.

→ Load Optimized Defaults

Select this option to load optimal default values for each BIOS parameter in the setup menus. Press **F7** for this operation on any page.

→ Set Supervisor Password

By default, no supervisor password is set. To install a supervisor password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password:** ". Type the password and press **ENTER**. Retype the original password into the "**Confirm Password:** " dialogue box and press **ENTER**. To disable the password, simply press **ENTER** in the "**Enter Password:** " dialogue box, then press any key in the "**Password Disabled !!!**" dialogue box.

→ Set User Password

By default no user password is set. To install a user password, select this field and enter the password. After this option is selected, a red dialogue box appears with "**Enter Password:** ". Type the password and press **ENTER**. Retype the original password into the "**Confirm Password:** " dialogue box and press **ENTER**. To disable the password, simply

press **ENTER** in the “**Enter Password:** ” dialogue box, then press any key in the “**Password Disabled !!!**” dialogue box.

➔ **Save & Exit Setup**

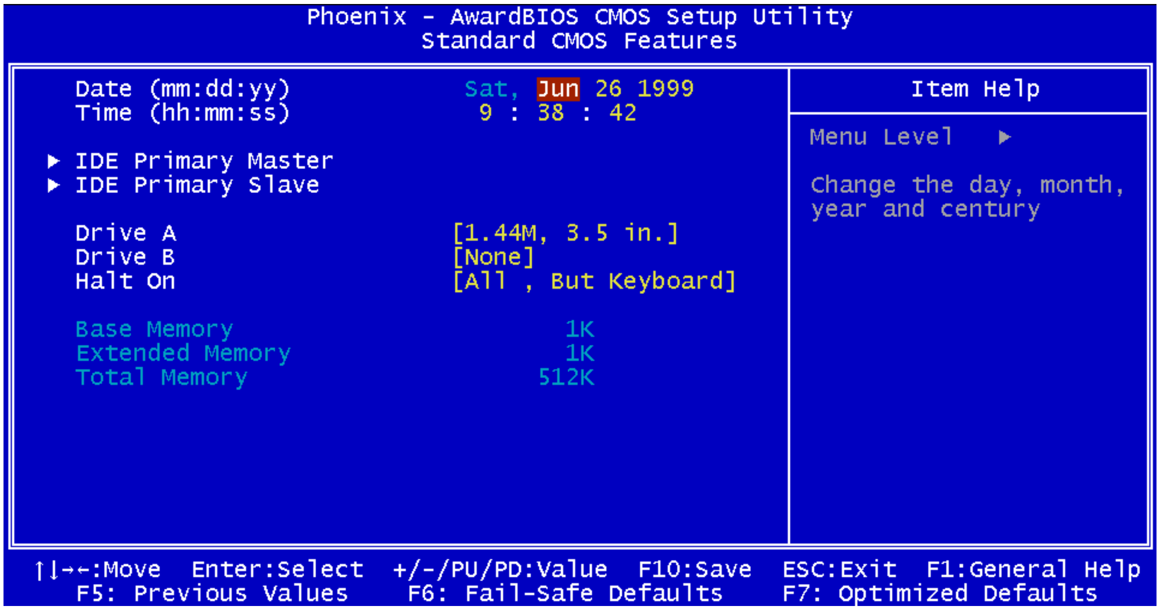
Select this option to save any configuration changes made and exit the BIOS menus.

➔ **Exit Without Saving**

Select this option exit the BIOS menus without saving any configuration changes.

5.2 Standard CMOS Features

Use the Standard CMOS Features BIOS menu (**BIOS Menu 2**) to set basic BIOS configuration options.



BIOS Menu 2: Standard CMOS Features

➔ **Date [Day mm:dd:yyyy]**

The **Date** option sets the system date.

➔ **Time [hh/mm/ss]**

The **Time** option sets the system time.

➔ IDE Master and IDE Slave

When entering setup, BIOS auto detects the presence of IDE devices. The **Standard CMOS Features** menu shows the status of the auto detected IDE devices. The following IDE devices are detected and shown in the **Standard CMOS Features** menu:

- IDE Primary Master
- IDE Primary Slave

IDE device configurations are changed or set in the IDE Configuration menu (**BIOS Menu 3**). If an IDE device is detected, and one of the above listed two BIOS configuration options is selected, the IDE configuration options shown in **Section 5.2.1** appear.

➔ Drive A [1.44M, 3.5in]

Use the Drive A configuration to specify the floppy drive type installed in the system. The floppy drive configuration options are:

- None
- 360K, 5.25 in.
- 1.2M, 5.25 in.
- 720K, 3.5 in.
- 1.44M, 3.5in (Default)
- 2.88M, 3.5 in.

➔ Drive B [None]

Use the Drive B configuration to specify the floppy drive type installed in the system. The floppy drive configuration options are:

- None (Default)
- 360K, 5.25 in.
- 1.2M, 5.25 in.
- 720K, 3.5 in.
- 1.44M, 3.5in
- 2.88M, 3.5 in.

➔ Halt On [All, But Keyboard]

Use the Halt On option to specify what errors detected during the power up process stop the system.

- ➔ **All Errors** — Whenever BIOS detects a non-fatal error the system is stopped and the user prompted.
- ➔ **No Errors** — The system boot is not stopped for any errors that may be detected.
- ➔ **All, But Keyboard** (Default) — The system boot does not stop for a keyboard error; it stops for all other errors.
- ➔ **All, But Diskette** — The system boot does not stop for a disk error; it stops for all other errors.
- ➔ **All, But Disk/Key** — The system boot does not stop for a keyboard or a disk error; it stops for all other errors.

➔ Base Memory:

The **Base Memory** is NOT user configurable. The POST determines the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed, or 640K for systems with 640K or more memory installed.

➔ Extended Memory

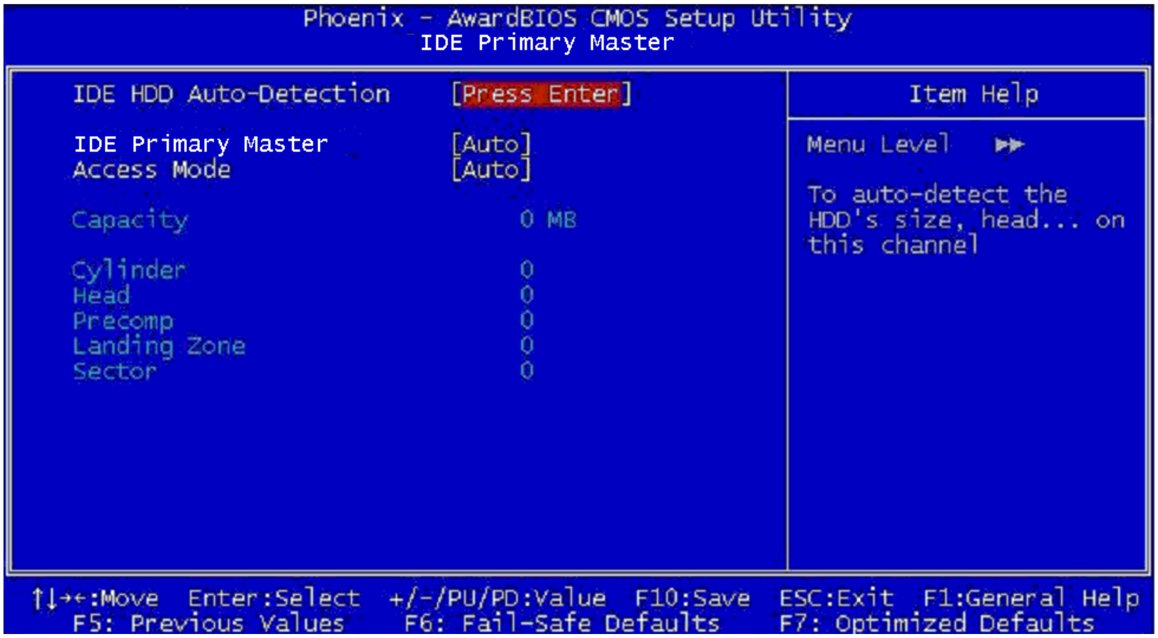
The **Extended Memory** is NOT user configurable. The BIOS determines how much extended memory is present during the POST. This is the amount of memory above 1MB located in the memory address map of the CPU.

➔ Total Memory

The **Total Memory** is NOT user configurable.

5.2.1 IDE Primary Master/Slave

Use the IDE Primary Master/Slave menu (**BIOS Menu 3**) to set or change the master/slave IDE configurations.



BIOS Menu 3: IDE Primary Master

➔ **IDE HDD Auto-Detection [Press Enter]**

Use the **IDE HDD Auto-Detection** option to enable BIOS to automatically detect the IDE settings. Select **IDE HDD Auto-Detection** and press **ENTER.** BIOS automatically detects the HDD type. Do not set this option manually.

➔ **IDE Primary Master [Auto]**

Use the **IDE Primary Master** option to activate or deactivate the following drive channels:

- Channel 0 Master
- Channel 0 Slave
- Channel 1 Master
- Channel 0 Slave

- ➔ **None** If no drives are connected to the IDE channel select this option. Once set, this IDE channel becomes inaccessible and any drives attached to it are undetected.
- ➔ **Auto** (Default) Setting this option allows the device to be automatically detected by the BIOS.
- ➔ **Manual** Selecting this option allows manual configuration of the device on the IDE channel in BIOS.

➔ Access Mode [Auto]

The **Access Mode** option can only be configured if the **IDE Primary Master** is set to either **Manual** or **Auto**. Use the **Access Mode** option to determine the hard disk BIOS translation modes. Most systems now use hard drives with large capacities and therefore either the LBA translation mode or auto mode should be selected.

- ➔ **CHS** Select this mode if the HDD capacity is less than 504MB.
- ➔ **LBA** Select this mode if the HDD capacity is more than 8.4GB.
- ➔ **Large** This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.
- ➔ **Auto** (Default) If you are unsure of what access mode to set, select this option.

➔ Capacity

The **Capacity** specification indicates the storage capacity of the HDD installed in the system.

➔ **Cylinder**

The **Cylinder** specification indicates how many cylinders (tracks) are on the HDD installed in the system.

➔ **Head**

The **Head** specification indicates how many logical heads are on the HDD installed in the system.

➔ **Precomp**

The **Precomp** specification indicates on what track the write precompensation begins.

➔ **Landing Zone**

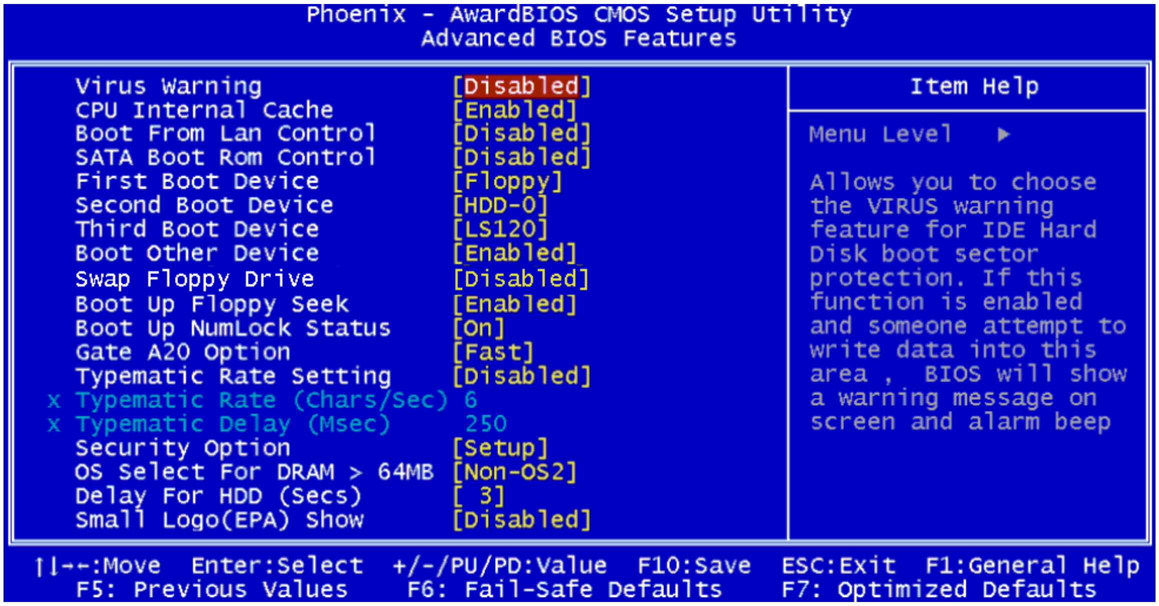
The **Landing Zone** specification indicates where the disk head will park itself after the system powers off.

➔ **Sector**

The **Sector** specification indicates how many logical sectors the HDD has been divided into.

5.3 Advanced BIOS Features

CPU and peripheral device configuration options are accessed in the **Advanced BIOS Features** menu (**BIOS Menu 4**).



BIOS Menu 4: Advanced BIOS Features

➔ **Virus Warning [Disabled]**

NOTE:

Many disk diagnostic programs can cause the above warning message to appear when the program attempts to access the boot sector table. If you are running such a program, it is recommended that the virus protection function be disabled beforehand.

Use the **Virus Warning** option to enable BIOS to monitor the boot sector and partition table of the HDD for any attempted modification. If a modification attempt is made, the BIOS halts the system and an error message appears. If necessary, an anti-virus program can then be run to locate and remove the virus before any damage is done.

➔ **Enabled** Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or HDD partition table.

➔ **Disabled** (Default) No warning message appears when there is an attempt to access the boot sector or HDD partition table.

➔ **CPU Internal Cache [Enabled]**

Use the **CPU Internal Cache** option to enable or disable the internal CPU cache.

➔ **Disabled** The internal CPU cache is disabled.

➔ **Enabled** (Default) The internal CPU cache is enabled.

➔ **Boot From LAN Control [Disabled]**

Use the **BOOT From LAN Control** option to enable the system to be booted from a remote system.

➔ **Disabled** (Default) The system cannot be booted from a remote system through the LAN.

➔ **Enabled** The system can be booted from a remote system through the LAN.

➔ **SATA Boot ROM Control [Disabled]**

Use the **SATA Boot ROM Control** option to configure SATA IDE use in DOS mode.

➔ **Disabled** (Default) Disables SATA IDE use in DOS mode.

➔ **Enabled** Enables SATA IDE use in DOS mode.

➔ **Boot Device**

Use the **Boot Device** options to select the order of the devices the system boots from. There are three boot device configuration options:

- **First Boot Device** [Default: Floppy]
- **Second Boot Device** [Default: HDD-0]
- **Third Boot Device** [Default: LS120]

Using the default values, the system first looks for a floppy disk to boot from. If it cannot find a floppy disk, it boots from an HDD. If both The floppy and the HDD are unavailable, the system boots from a CDROM drive.

Boot Device configuration options are:

- Floppy
- LS120
- HDD-0
- SCSI
- CDROM
- HDD-1
- ZIP100
- USB-FDD
- USB-ZIP
- USB-CDROM
- USB-HDD
- LAN
- Disabled

➔ **Boot Other Device [Enabled]**

Use the **Boot Other Device** option to determine whether the system uses a second or third boot device if the first boot device is not found.

➔ **Disabled** The system does not look for second and third boot devices if the first one is not found.

➔ **Enabled** (Default) The system looks for second and third boot devices if the first one is not found.

→ Swap Floppy Drive [Disabled]

The **Swap Floppy Drive** option is effective only in systems with two floppy drives. Selecting **Enabled** assigns physical drive B to logical drive A, and physical drive A to logical drive B.

- → **Enabled** — Assigns physical drive B to logical drive A, and physical drive A to logical drive B.
- → **Disabled** (Default) — Default physical/logical drive assignations.

→ Boot Up Floppy Seek [Disabled]

Use the **Boot Up Floppy Seek** option to enable the BIOS to determine if the floppy disk drive installed has 40 or 80 tracks during the POST. 360K FDDs have 40 tracks while 760K, 1.2M and 1.44M FDDs all have 80 tracks.

- → **Disabled** (Default) — BIOS does not search for the type of FDD drive by track number. Note that there is no warning message if the drive installed is 360K.
- → **Enabled** — BIOS searches for a FDD to determine if it has 40 or 80 tracks. Note that BIOS cannot tell the difference between 720K, 1.2M or 1.44M drives as they all have 80 tracks.

→ Boot Up Numlock Status [On]

Use the **Boot Up Numlock Status** option to specify the default state of the numeric keypad.

- → **Off** — The keys on the keypad are not activated.
- → **On** (Default) — Activates the keys on the keypad.

➔ Gate A20 Option [Fast]

Use the **Gate A20 Option** option to set if the keyboard controller or the chipset controls the Gate A20 switching.

- ➔ **Normal** The keyboard controller does the switching.
- ➔ **Fast** (Default) The chipset does the switching.

➔ Typematic Rate Setting [Disabled]

Use the **Typematic Rate Setting** configuration option to specify if only one character is allowed to appear on the screen if a key is continuously held down. When this option is enabled, the BIOS reports as before, but it then waits a moment, and, if the key is still held down, it begins to report that the key has been pressed repeatedly. This feature accelerates cursor movement with the arrow keys.

- ➔ **Disabled** (Default) Disables the typematic rate.
- ➔ **Enabled** Enables the typematic rate.

➔ Typematic Rate (Chars/sec) [6]

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Rate** option to specify the rate keys are accelerated.

- ➔ **6** (Default) 6 characters per second
- ➔ **8** 8 characters per second
- ➔ **10** 10 characters per second
- ➔ **12** 12 characters per second
- ➔ **15** 15 characters per second
- ➔ **20** 20 characters per second
- ➔ **24** 24 characters per second

→ **30** 30 characters per second

→ **Typematic Delay (Msec) [250]**

The **Typematic Rate** option can only be configured if the **Typematic Rate Setting** is enabled. Use the **Typematic Delay** option to specify the delay time between when a key is first pressed and when the acceleration begins.

→ **250** (Default) 250 milliseconds

→ **500** 500 milliseconds

→ **750** 750 milliseconds

→ **1000** 1000 milliseconds

→ **Security Option [Setup]**

Use the **Security Option** to limit access to both the system and Setup, or just Setup.

→ **Setup** (Default) The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.

→ **System** The system boots, but access to Setup is denied if the correct password is not entered at the prompt.

NOTE:

To disable security, select the password setting in the Main Menu. When asked to enter a password, don't type anything, press **ENTER** and the security is disabled. Once the security is disabled, the system boots and **Setup** can be accessed.

→ **OS Select For DRAM > 64MB [Non-OS2]**

Use the **OS Select For DRAM > 64MB** option to specify the operating system.

→ **Enabled** Specifies the operating system used as OS/2.

→ **Disabled** (Default) Select this option when not using the OS/2 operating system.

→ **Delay for HDD (Secs) [3]**

Use the **Delay for HDD** option to specify the period of time the system should wait before the HDD is identified. If selected, the user is asked to enter a number between 0 and 15. The number specified is the number of seconds the system waits before the HDD is identified.

→ **Small Logo (EPA) Show [Disabled]**

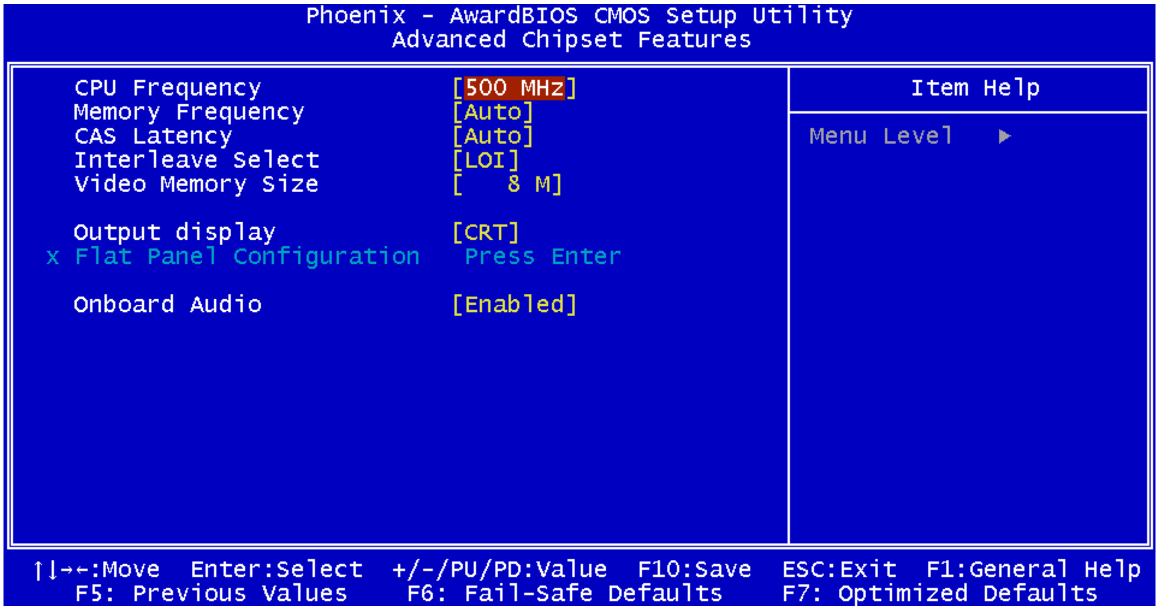
Use the **Small Logo (EPA) Show** option to specify if the Environmental Protection Agency (EPA) logo appears during the system boot-up process. If enabled, the boot up process may be delayed.

→ **Disabled** (Default) EPA logo does not appear during boot up.

→ **Enabled** EPA logo appears during boot up.

5.4 Advanced Chipset Features

Use the Advanced Chipset Features menu (**BIOS Menu 5**) to change chipset configuration options.



BIOS Menu 5: Advanced Chipset Features

→ CPU Frequency [500MHz]

Use the **CPU Frequency** option to set the CPU frequency.

- 500MHz (Default)

→ Memory Frequency [Auto]

Use the **Memory Frequency** option to set the frequency of the installed DRAM modules. The **Memory Frequency** options are:

- Auto (Default)
- DDR 200
- DDR 266
- DDR 333

→ CAS Latency [Auto]

Use the **CAS Latency Time** option to set the Column Address Strobe (CAS) delay time. The **CAS Latency Time** options are:

- Auto (Default)
- 1.5 nanoseconds
- 2.0 nanoseconds
- 2.5 nanoseconds
- 3.0 nanoseconds
- 3.5 nanoseconds

→ Interleave Select [LOI]

Use the **Interleave Select** option to specify how the cache memory is interleaved.

→ **LOI** (Default) Low order interleaving (LOI) of memory occurs.

→ **HOI** High order interleaving (HOI) of memory occurs.

→ Video Memory Size [8M]

Use the **Video Memory Size** option to determine how much memory is allocated to the video graphics device. The **Video Memory Size** options are:

- None
- 8M (Default)
- 16M
- 32M
- 64M
- 128M
- 254M

→ Output Display [CRT]

Use the **Output Display** configuration to specify the display devices the system is connected to. The **Output Display** options are:

- Flat Panel

- CRT (Default)
- Panel & CRT

→ **Flat Panel Configuration [Press Enter]**

Use the Flat Panel Configuration option to open the Flat Panel Configuration menu. The Flat Panel Configuration options are shown in **Section 5.4.1**.

→ **OnBoard Audio [Enabled]**

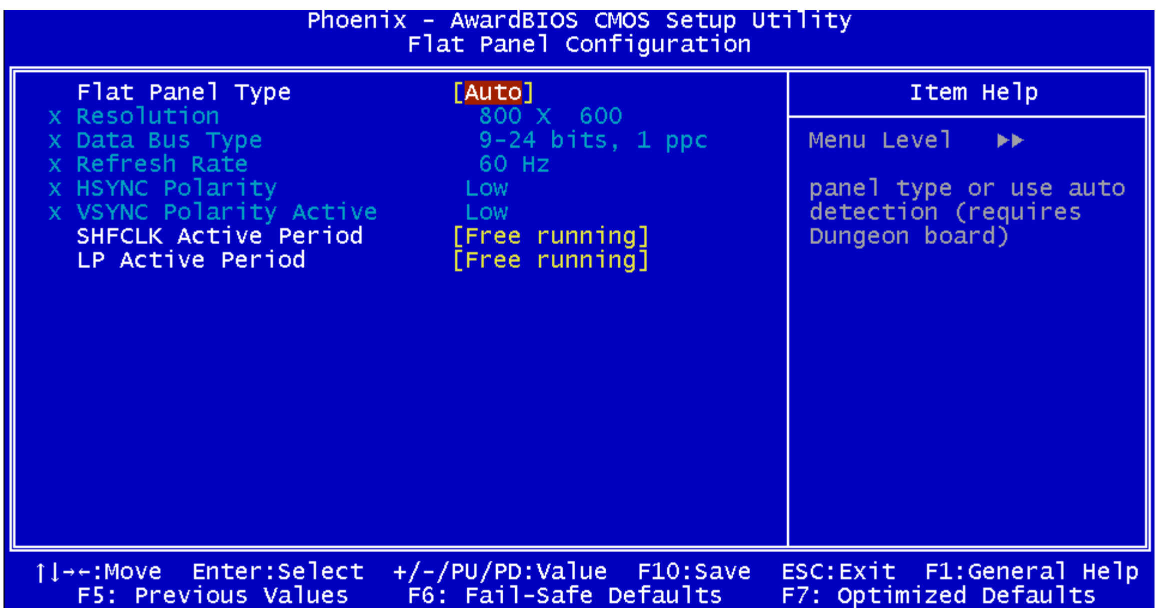
Use the **OnBoard Audio** option to enable or disable the onboard codec.

→ **Disabled** The onboard codec is disabled.

→ **Enabled** (Default) The onboard codec is detected and enabled.

5.4.1 Flat Panel Configuration

Use the **Flat Panel Configuration** menu (**BIOS Menu 6**) to set the configuration settings for the flat panel screen connected to the system.



BIOS Menu 6: Flat Panel Configuration

➔ Flat Panel Type [Auto]

Use the **Flat Panel Type** option to specify the type of flat panel screen connected to the system.

- ➔ **TFT** — Specifies the system is connected to a TFT display.
- ➔ **LVDS** — Specifies the system is connected to an LVDS display.
- ➔ **Auto** (Default) — The system detects the display type and the display settings.

➔ Resolution [800 x 600]

The **Resolution** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Resolution** option to set the resolution of the flat panel screen connected to the system. The **Resolution** options are:

- 320 x 240
- 640 x 480
- 800 x 600 (Default)
- 1024 x 768
- 1152 x 864
- 1280 x 1024
- 1600 x 1200

➔ Data Bus Type [9 – 24 bits, 1 ppc]

The **Data Bus Type** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Data Bus Type** option to set the bus type and the data bus width used to transfer data between the system and the flat panel screen connected to the system. The **Data Bus Type** options are:

- 9-24 bits, 1 ppc (Default)
- 18, 24 bits, 2 ppc

→ Refresh Rate [60Hz]

The **Refresh Rate** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **Refresh Rate** option to set the screen refresh rate required by the panel connected to the system. Check the documentation that came with the panel before setting this option. The **Refresh Rate** options are:

- 60Hz (Default)
- 70Hz
- 72Hz
- 75Hz
- 85Hz
- 90Hz
- 100Hz

→ HSYNC Polarity [Low]

The **HSYNC Polarity** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **HSYNC Polarity** option to set the polarity of the HSYNC signal to the panel. The **HSYNC Polarity** options are:

- High
- Low (Default)

→ VSYNC Polarity Active [Low]

The **VGSYNC Polarity Active** option can only be configured if the **Flat Panel Type** option is not set to **Auto**. Use the **VGSYNC Polarity Active** option to set the polarity of the VSYNC signal to the panel. The **VGSYNC Polarity Active** options are:

- High
- Low (Default)

→ **SHFCLK Active Period [Free Running]**

Use the **SHFCLK Active Period** option to set the SHFCLK. The **SHFCLK Active Period** options are:

- Active Only
- Free running (Default)

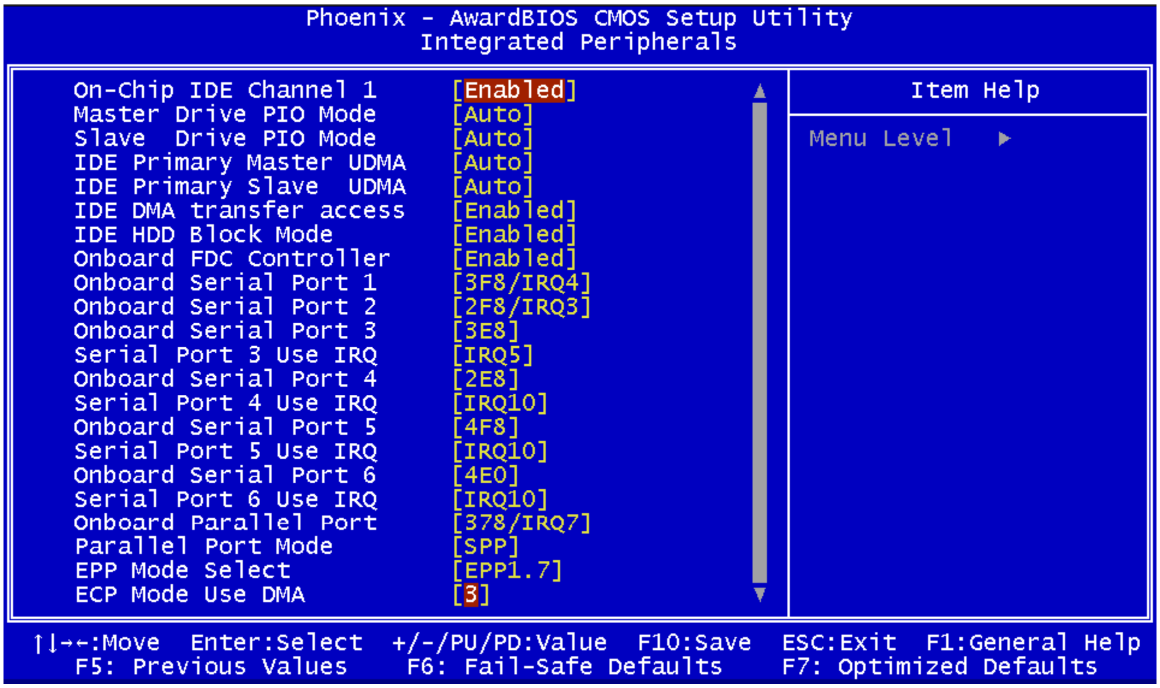
→ **LP Active Period [Free Running]**

Use the **LP Active Period** option to set the LDE/MOD signal to the panel. The **LP Active Period** options are:

- Active Only
- Free running (Default)

5.5 Integrated Peripherals

Use the Integrated Peripherals menu (**BIOS Menu 7**) to change the configuration options for the attached peripheral devices.



BIOS Menu 7: Integrated Peripherals

→ **On-Chip IDE Channel 1 [Enabled]**

The **On-Chip IDE Channel 1** option is enabled and is NOT user configurable.

→ **Drive PIO Mode [Auto]**

Use the **Drive PIO Mode** options below to select the Programmed Input/Output (PIO) mode for the following HDDs:

- Master Drive PIO Mode
- Slave Drive PIO Mode

→ **Auto** (Default) The computer selects the correct mode.

- ➔ **Mode 0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps.
- ➔ **Mode 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps.
- ➔ **Mode 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps.
- ➔ **Mode 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps.
- ➔ **Mode 4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps.

➔ IDE UDMA [Auto]

Use the **IDE UDMA** option below to select the Ultra DMA (UDMA) mode for the following HDDs:

- IDE Primary Master UDMA
- IDE Primary Slave UDMA

- ➔ **Auto** (Default) The computer selects the correct UDMA.
- ➔ **Disabled** The UDMA for the HDD device is disabled.

➔ IDE DMA transfer access [Enabled]

Use the **IDE DMA transfer access** option to enable or disable DMA support for IDE devices connected to the system.

- ➔ **Disabled** All IDE drive DMA transfers are disabled. The IDE drives use PIO mode transfers.
- ➔ **Enabled** (Default) All IDE drive DMA transfers are enabled.

➔ IDE HDD Block Mode [Enabled]

If the drive connected to the system supports block mode, use the **IDE HDD Block Mode** option to enable the system to detect the optimal number of block read/writes per sector the system IDE drive can support. Block mode is also called block transfer, multiple commands, or multiple sector read/write.

➔ **Disabled** Block mode is not supported.

➔ **Enabled** (Default) Block mode is supported.

➔ Onboard FDC Controller [Enabled]

Use the **Onboard FDC Controller** option to enable or disable the onboard floppy controller. If the system is not connected to a floppy disk or uses an adapter for the FDD, this option can be disabled.

➔ **Disabled** The FDD controller is disabled.

➔ **Enabled** (Default) The FDD controller is enabled.

➔ Onboard Serial Port 1 [3F8/IRQ4]

Use the **Onboard Serial Port 1** option to select the I/O address and IRQ for the onboard serial port 1. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 1** options are:

- Disabled
- 3F8/IRQ4 (Default)
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

→ Onboard Serial Port 2 [2F8/IRQ3]

Use the **Onboard Serial Port 2** option to select the I/O address and IRQ for the onboard serial port 2. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The **Onboard Serial Port 2** options are:

- Disabled
- 3F8/IRQ4
- 2F8/IRQ3 (Default)
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

→ Onboard Serial Port # [XXX]

Use the **Onboard Serial Port #** option to select the I/O address and IRQ for any additional onboard serial ports. The **Onboard Serial Port #** address options are:

- Disabled
- 3F8
- 2F8
- 3E8
- 2E8
- 4F8
- 4E0

→ Serial Port # Use IRQ [XXX]

Use the **Serial Port # Use IRQ** option to select the IRQ for the additional onboard serial ports listed above. The **Serial Port # Use IRQ** IRQ options are:

- IRQ5
- IRQ7
- IRQ10
- IRQ11

→ Onboard Parallel Port [378/IRQ7]

Use the **Onboard Parallel Port** option to specify a logical LPT port address and corresponding interrupt for the physical parallel port. The **Onboard Parallel Port** options are:

- Disabled
- 378/IRQ7 (Default)
- 278/IRQ5
- 3BC/IRQ7

→ Parallel Port Mode [SPP]

Use the **Parallel Port Mode** option to select parallel port operation mode.

→ **SPP** (Default) The parallel port operates in the standard parallel port (SPP) mode. This parallel port mode works with most parallel port devices but is slow.

→ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

→ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

→ **ECP+EPP** The parallel port is compatible with both ECP and EPP devices.

→ **Normal**

➔ **x EPP Mode Select [EPP1.7]**

The **EPP Mode Select** option is only available if the **Parallel Port Mode** option is set to EPP mode. Use the **EPP Mode Select** option to select the parallel port mode standard for the parallel port.

➔ **EPP1.9** EPP 1.9 is selected as the EPP standard.

➔ **EPP1.7** (Default) EPP 1.7 is selected as the EPP standard.

➔ **x ECP Mode Use DMA [3]**

The **ECP Mode Use DMA** option is only available if the **Parallel Port Mode** option is set to ECP mode. Use the **ECP Mode Use DMA** option to specify the DMA channel the parallel port must use in the ECP mode.

➔ **1** The parallel port uses DMA Channel 1 in ECP mode.

➔ **3** (Default) The parallel port uses DMA Channel 3 in ECP mode.

5.6 Power Management Setup

Use the **Power Management Setup** menu (**BIOS Menu 8**) to set the BIOS power management and saving features.

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                         Power Management Setup

 x ACPI Function              Enabled          |       Item Help
   ACPI Suspend Type          [S1&S3]          |
   Power Management           [ACPI]           | Menu Level   ►

          ** PM Timers **
 x Standby Mode               Disabled
 x Suspend Mode               Disabled
   Soft-Off by PWR-BTTN       [Instant-Off]

↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
   F5: Previous Values     F6: Fail-Safe Defaults     F7: Optimized Defaults
```

BIOS Menu 8: Power Management Setup

➔ **x ACPI Function [Disabled]**

The **ACPI Function** is enabled when the **Power Management** option is set to ACPI; otherwise, it is disabled.

➔ **ACPI Suspend Type [S1&S3]**

When the system is in the [S1&S3] suspend state, the system appears off. The CPU is stopped, RAM is refreshed and the system is runs in a low power mode.

➔ **S1(POS)** Sets the ACPI Suspend Type to POS (Power On Suspend).

➔ **S3(STR)** Sets the ACPI Suspend Type to STR (Suspend To RAM).

➔ **S1&S3** (Default) Sets the ACPI Suspend Type to POS and STR.

→ Power Management [ACPI]

Use the **Power Management** option to set the power management type used by the system.

- → **Disabled** — All power management options are turned off. The only user configurable options are the power button and alarm settings.
- → **Legacy** — Standby and suspend modes can be set.
- → **APM** — Advanced power management (APM) is activated
- → **ACPI** (Default) — Advanced Configuration and Power Interface (ACPI) is activated.

→ x Standby Mode [Disabled]

The **Standby Mode** option can only be selected if the **Power Management** option is set to **Legacy**. The **Standby Mode** specifies the amount of time the system can be inactive before the system enters standby mode. The **Standby Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min
- 45 Min
- 60 Min
- 90 Min
- 120 Min

→ **x Suspend Mode [Disabled]**

The **Suspend Mode** option can only be selected if the **Power Management** option is set to Legacy. The **Suspend Mode** specifies the amount of time the system can be inactive before the system enters suspend mode. The **Suspend Mode** options are:

- Disabled (Default)
- 1 Sec
- 5 Sec
- 10 Sec
- 15 Sec
- 30 Sec
- 45 Sec
- 1 Min
- 5 Min
- 10 Min
- 15 Min
- 30 Min
- 45 Min
- 60 Min
- 90 Min
- 120 Min

→ **Soft-Off by PWR-BTTN [Instant-Off]**

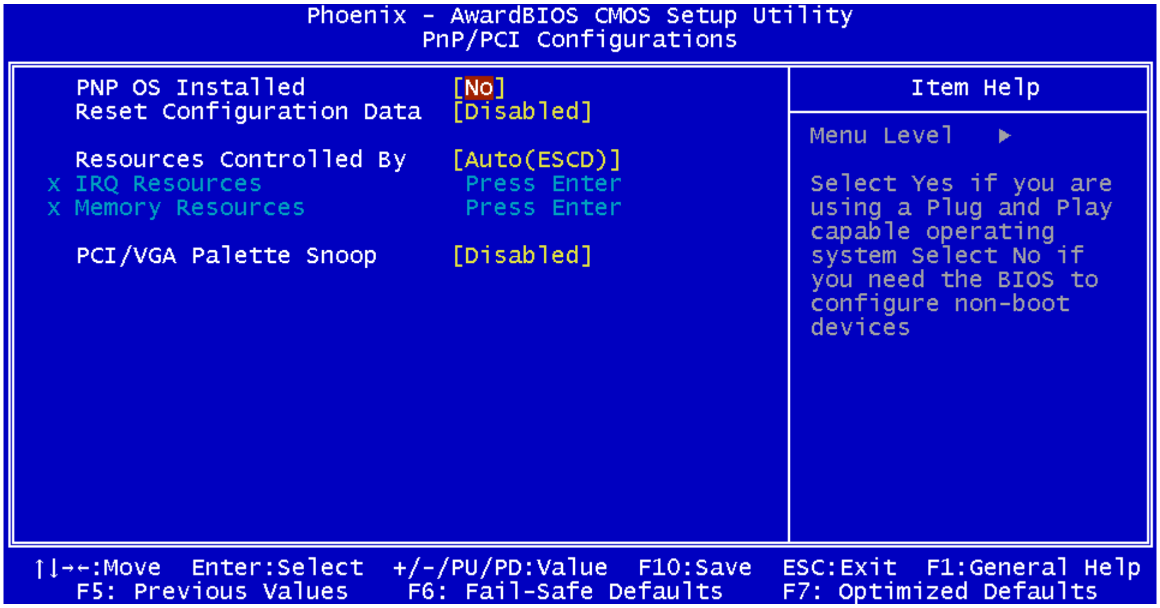
Use the **Soft-Off by PWR-BTTN** option to enabled the system to enter a very low-power-usage state when the power button is pressed.

→ **Instant-Off** (Default) When the power button is pressed, the system is immediately shutdown.

→ **Delay 4-sec** To shutdown the system the power button must be held down longer than four seconds otherwise the system enters a low power usage state.

5.7 PnP/PCI Configurations

Use the PnP/PCI Configurations menu (**BIOS Menu 9**) to set the plug and play, and PCI options.



BIOS Menu 9: PnP/PCI Configurations

➔ **PNP OS Installed [No]**

The **PNP OS Installed** option determines whether the Plug and Play devices connected to the system are configured by the operating system or the BIOS.

➔ No (Default) If the operating system does not meet the Plug and Play specifications, BIOS configures all the devices in the system.

➔ Yes Set this option if the system is running Plug and Play aware operating systems. The operating system changes the interrupt, I/O, and DMA settings.

➔ **Reset Configuration Data [Disabled]**

Use the **Reset Configuration Data** option to reset the Extended System Configuration Data (ESCD) when exiting setup if booting problems occur after a new add-on is installed.

- ➔ **Disabled** (Default) ESCD will not be reconfigured
- ➔ **Enabled** ESCD will be reconfigured after you exit setup

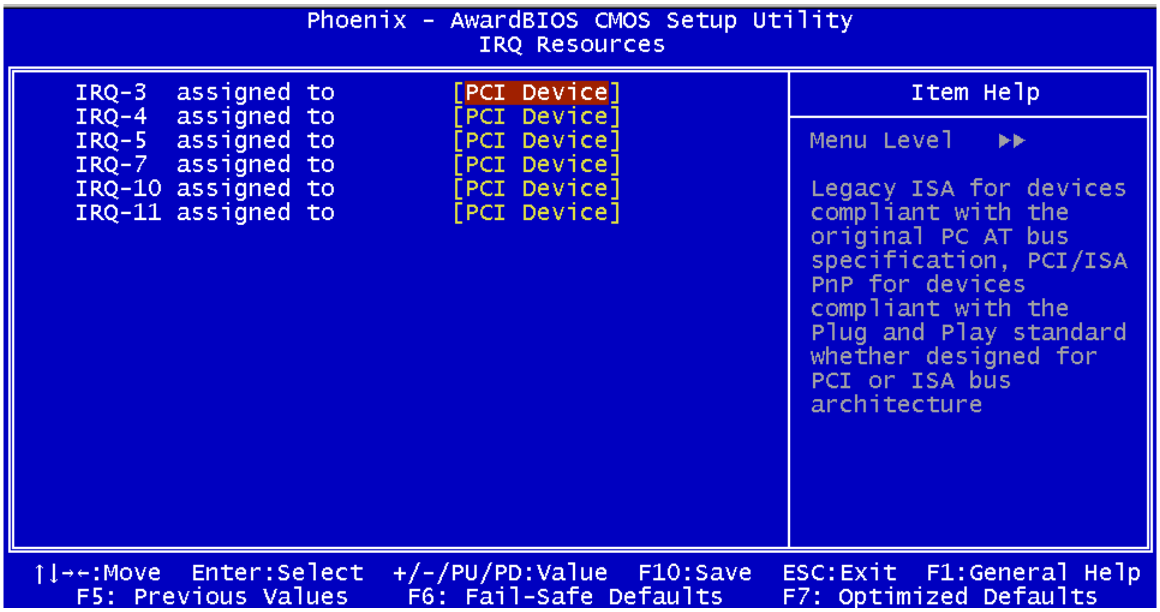
➔ Resources Controlled By [Auto (ESCD)]

Use the **Resources Controlled By** option to either manually configure all the boot and plug and play devices, or allow BIOS to configure these devices automatically. If BIOS is allowed to configure the devices automatically IRQs, DMA and memory base address fields cannot be set manually.

- ➔ **Auto(ESCD)** (Default) BIOS automatically configures plug and play devices as well as boot devices.
- ➔ **Manual** Manually configure the plug and play devices and any other boot devices.

➔ x IRQ Resources [Press Enter]

The IRQ Resources option (**BIOS Menu 10**) can only be selected if the Resources Controlled By option is set to Manual.



BIOS Menu 10: IRQ Resources

The **IRQ Resources** menu has the following options:

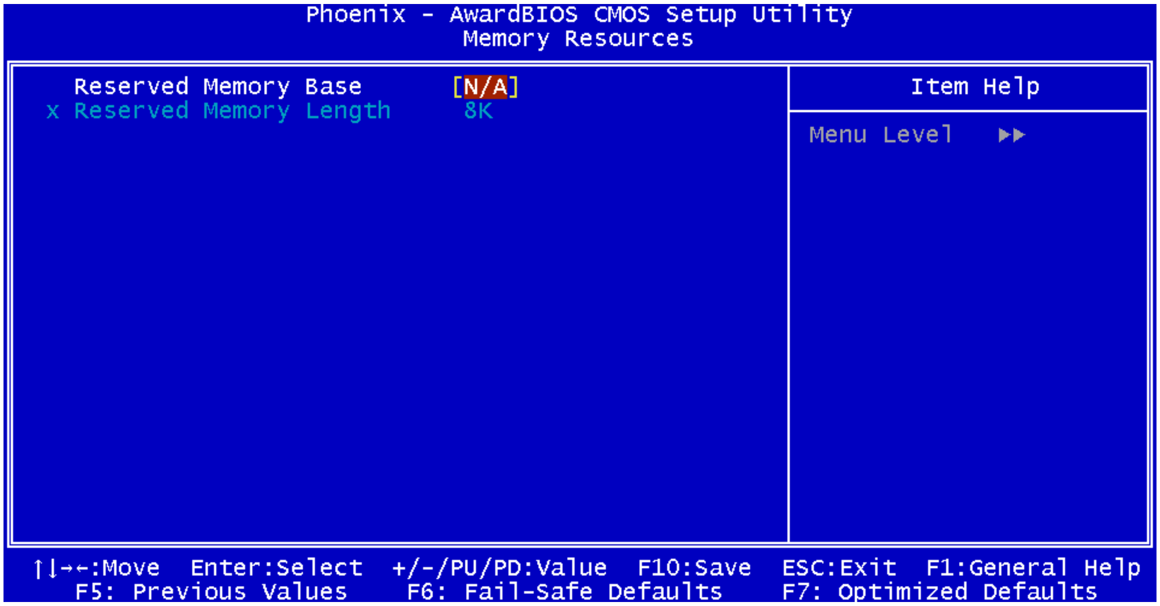
- IRQ-3 assigned to
- IRQ-4 assigned to
- IRQ-5 assigned to
- IRQ-7 assigned to
- IRQ-10 assigned to
- IRQ-11 assigned to

The above options all have the following default options.

- → **PCI Device** (Default) The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
- → **Reserved** The IRQ is reserved by BIOS.

→ **x Memory Resources [Press Enter]**

The Memory Resources menu (**BIOS Menu 11**) can only be accessed if the Resources Controlled By option is set to Manual. Use Memory Resources to select a base address and the length for the memory area used by a peripheral that requires high memory.



BIOS Menu 11: Memory Resources

The menu has two configurable options:

- Reserved Memory Base
- Reserved Memory Length

➔ Reserved Memory Base [N/A]

The **Reserved Memory Base** option specifies the base address for the peripheral device.

The **Reserved Memory Base** options are:

- N/A (Default)
- C800
- CC00
- D000
- D400
- D800
- DC00

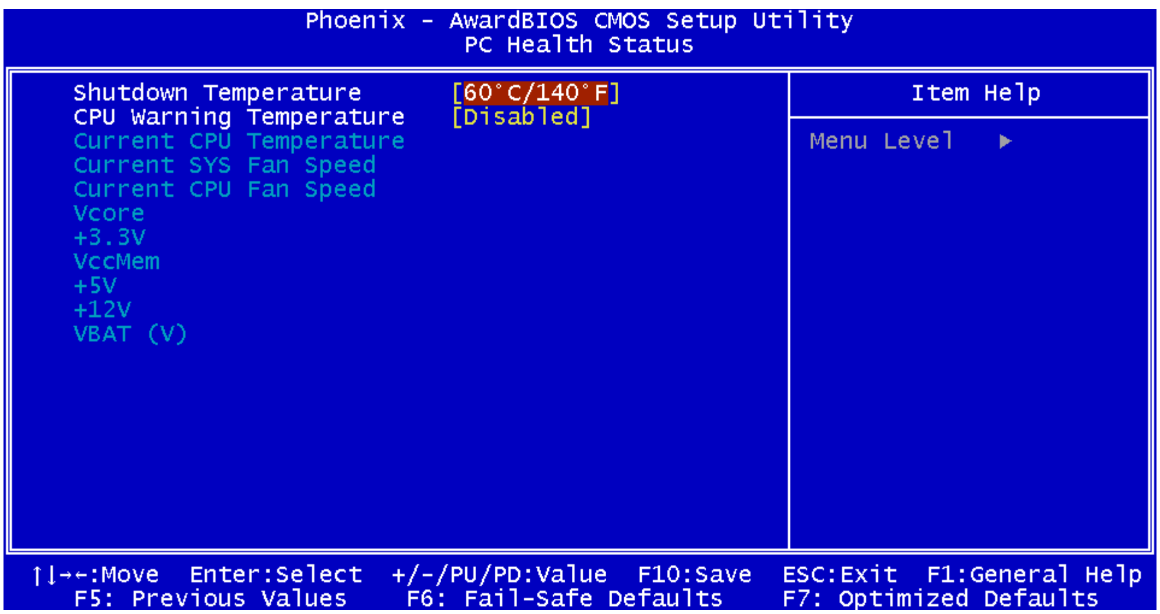
→ x Reserved Memory Length [8K]

The **Reserved Memory Length** option can only be accessed if the **Reserved Memory Base** option is not set to **N/A**. The **Reserved Memory Length** specifies the amount of memory reserved for the peripheral device. The **Reserved Memory Length** options:

- 8K (Default)
- 16K
- 32K
- 64K

5.8 PC Health Status

The **PC Health Status** menu (**BIOS Menu 12**) has two user configurable options, and shows system operating parameters that are essential to the stable operation of the system.



BIOS Menu 12: PC Health Status

→ Shutdown Temperature [60°C/140°F]

Use the **Shutdown Temperature** option to specify a CPU operating temperature threshold that, when reached, would shutdown the system.

- 60°C/140°F (Default)
- 65°C/149°F
- 70°C/158°F
- Disabled

→ CPU Warning Temperature [Disabled]

Use the **CPU Warning Temperature** option to specify a CPU operating temperature threshold that, when reached, generates a warning signal.

- Disabled (Default)
- 50°C/122°F
- 53°C/127°F
- 56°C/133°F
- 60°C/140°F
- 63°C/145°F
- 66°C/151°F
- 70°C/158°F

The following system parameters are monitored by the **PC Health Status** menu:

→ Temperatures

The following temperature is monitored:

- Current CPU Temperature

→ Fan Speeds

The following fan speeds are monitored:

- Current SYS Fan Speed
- Current CPU Fan Speed

➔ **Voltages**

The following voltages are monitored:

- Vcore
- VccMem
- +3.3 V
- +5 V
- +12 V
- VBAT (V)

Chapter 6

Driver Installation

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The KINO-LX CPU card has five software drivers:

- VGA Driver
- Audio Driver
- LAN Driver
- SATA/RAID Driver
- ISA Driver

All five drivers can be found on the CD that came with the CPU card. To install the drivers please follow the instructions in the sections below.

Insert the CD into the system that contains the KINO-LX CPU card.

NOTE:

If your system does not run the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (replace **X** with the actual drive letter for your CD-ROM) to access the **IEI Driver CD** main menu.

Step 1: From the AMD LX/GX Driver CD main menu (**Figure 6-1**), click **KINO-LX**.



Figure 6-1: AMD LX/GX CD Main Menu

Step 2: A window appears listing the drivers available for installation (**Figure 6-2**).

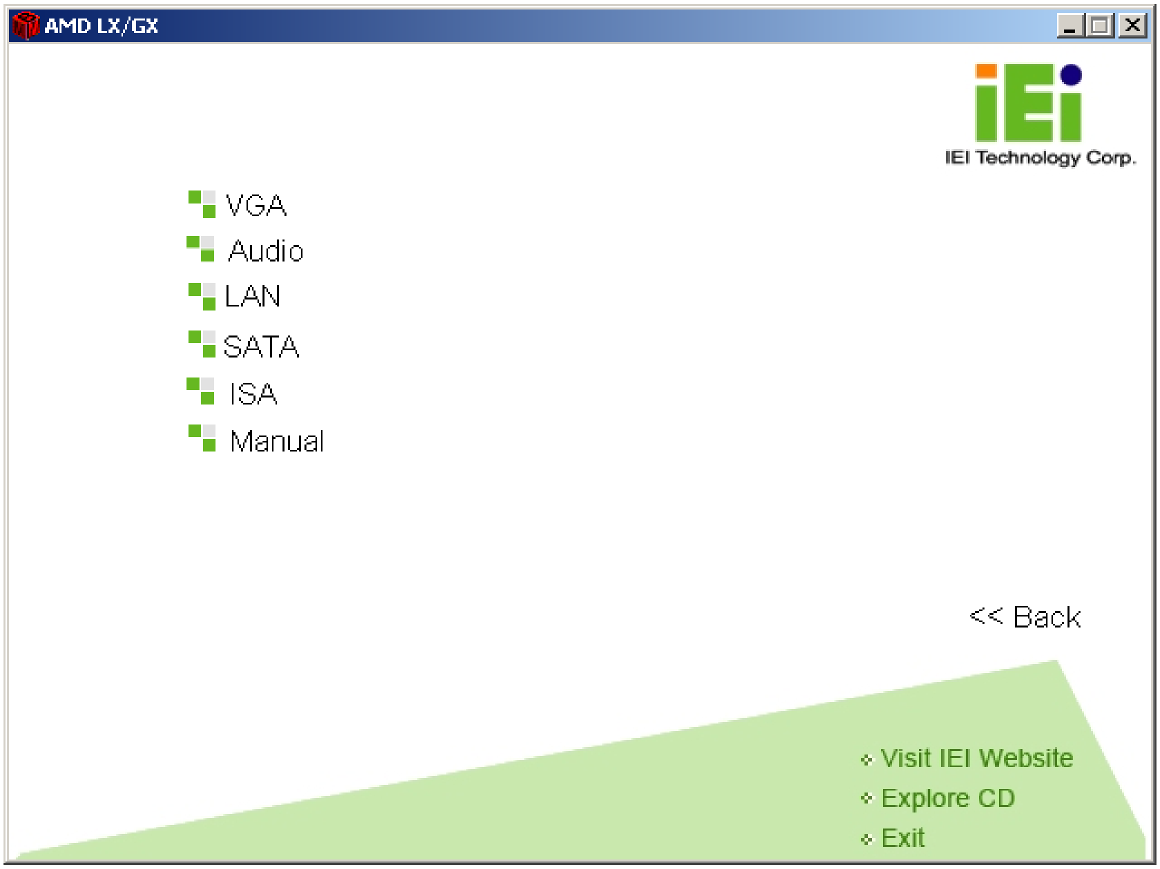


Figure 6-2: AMD LX/GX CD Driver Menu

Step 3: Select any item from the list to view more information on the driver installation, or select Manual to navigate to the KINO-LX user manual.

The following sections fully describe the driver installation procedures for the KINO-LX CPU card.

6.2 VGA Driver

To install the VGA driver please follow the steps below.

Step 1: Open **Windows Control Panel** (**Figure 6-3**).

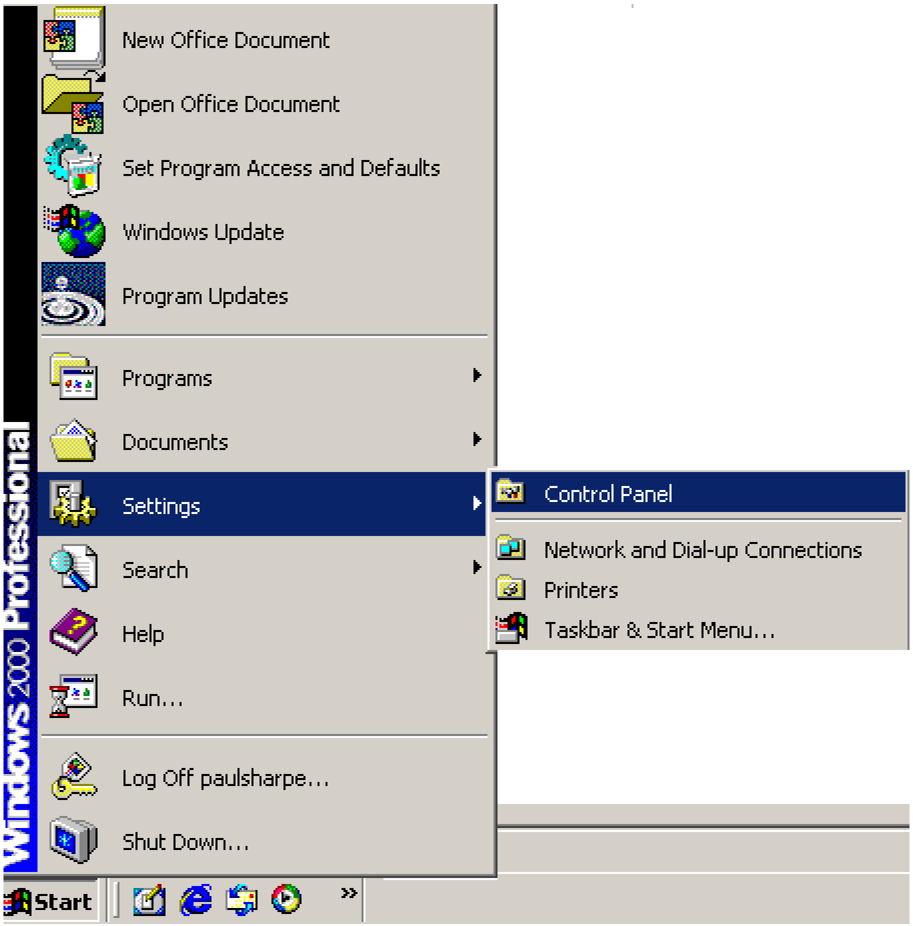


Figure 6-3: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-4**).

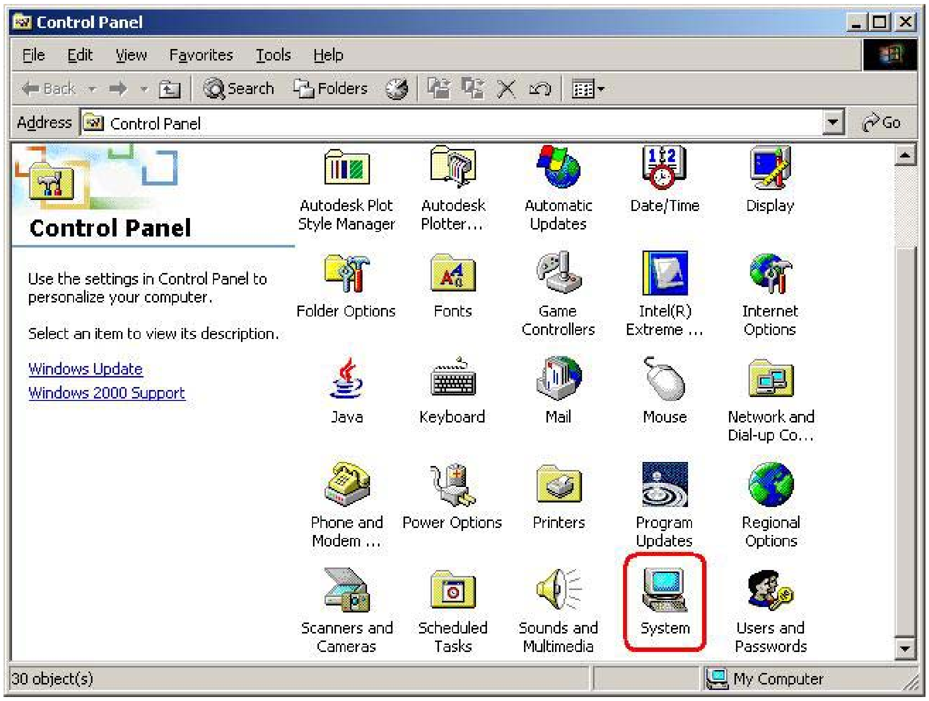


Figure 6-4: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-5**).

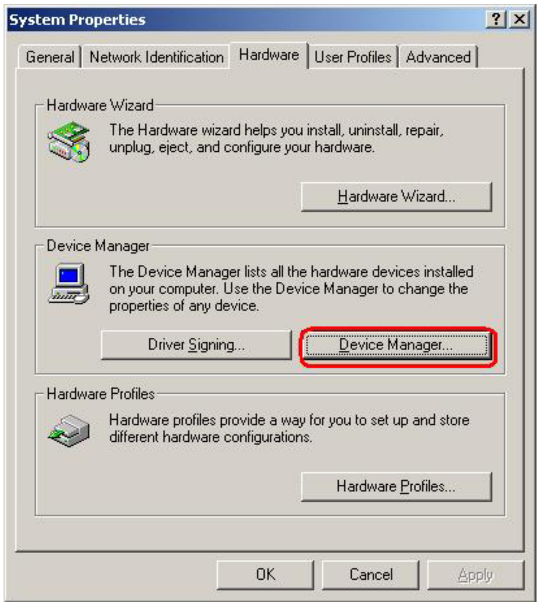


Figure 6-5: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-6**).

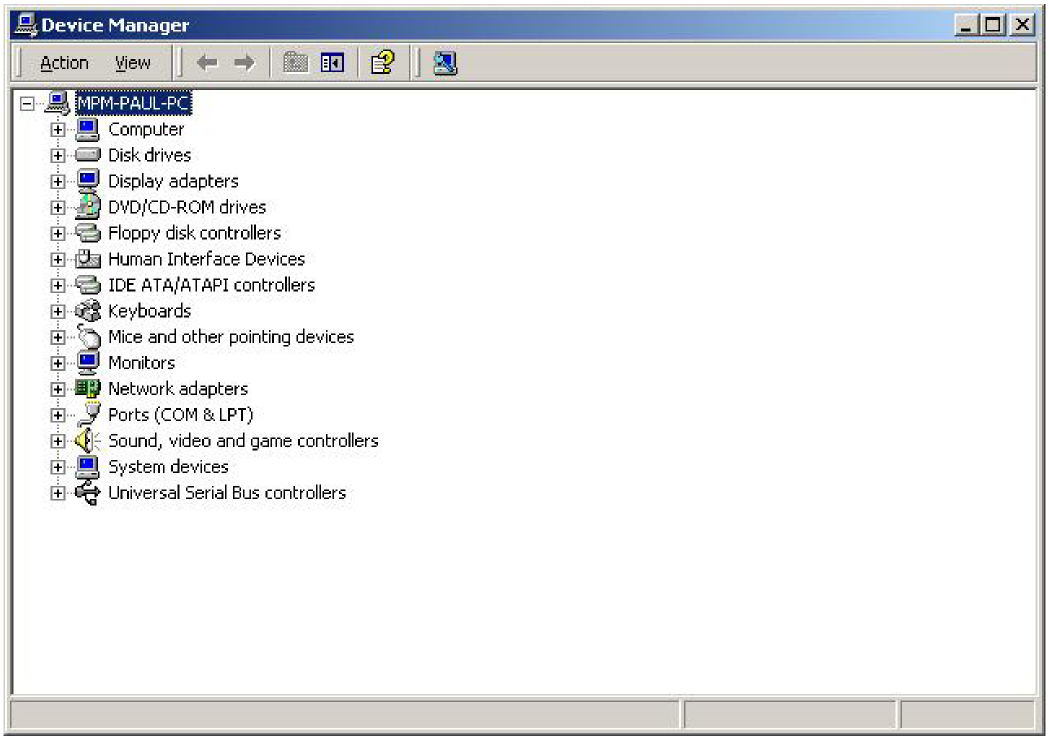


Figure 6-6: Device Manager List

Step 5: Expand the **Display Adapters** category (**Figure 6-7**). Right click the adapter and select **Properties**.

NOTE:

If the **Display Adapters** category is not available, navigate to **X:\VGA\LX800\XP\VGA 2.01.05** (where **X:** is the system CD drive) and read the **ReleaseNotes.txt** file for further information on installing the VGA driver.

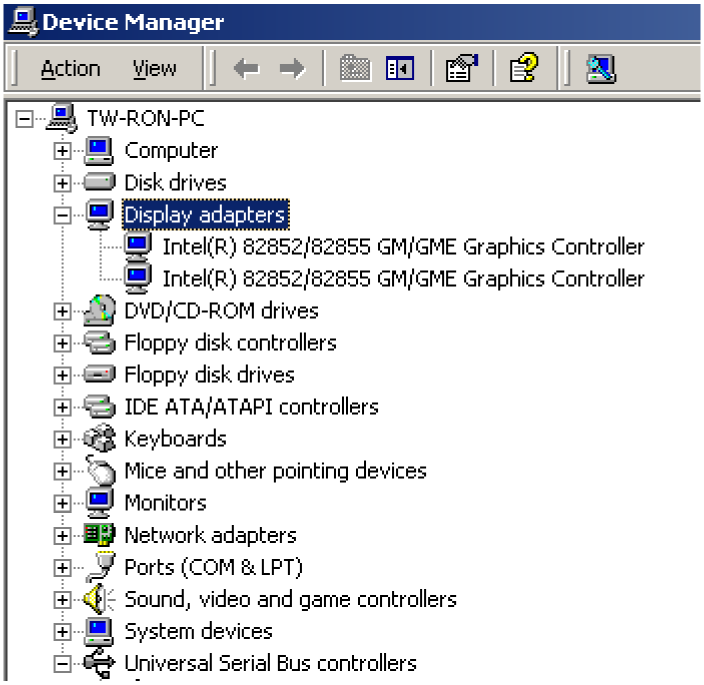


Figure 6-7: Expand the Display Adapters Category

Step 6: From the **Driver** tab of the **Properties** window, click **Update Driver** (**Figure 6-8**) or, click **Reinstall Driver** if **Update Driver** is not seen.

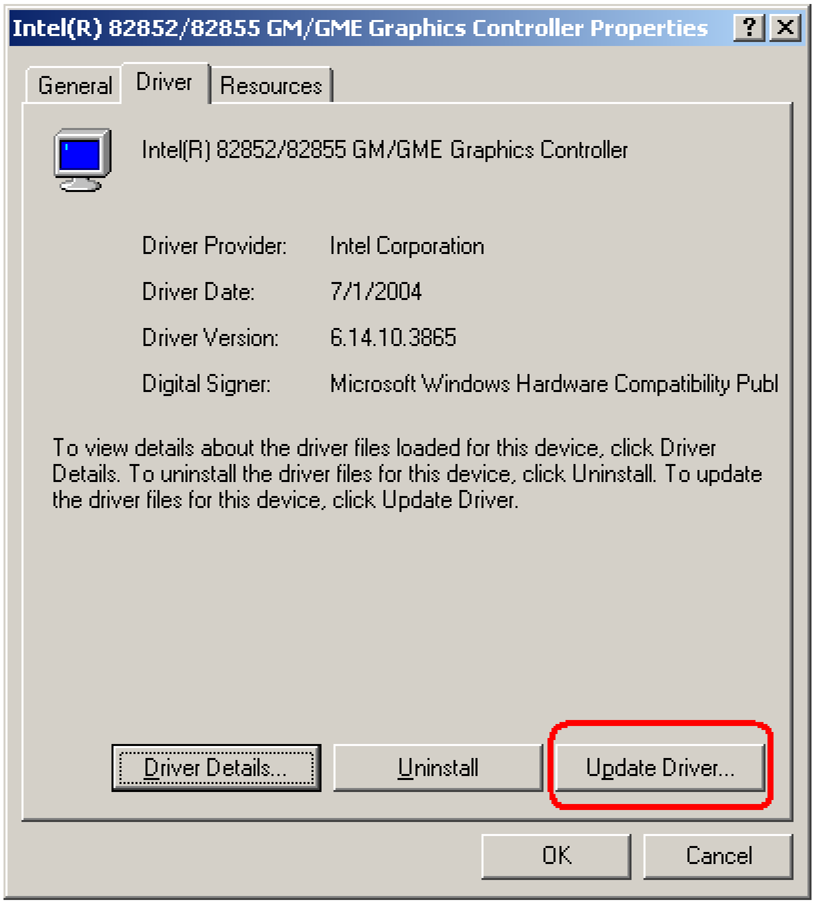


Figure 6-8: Update Driver

Step 7: The **Upgrade Device Driver Wizard** appears (**Figure 6-9**). Click **NEXT** to continue.



Figure 6-9: Upgrade Device Driver Wizard

Step 8: The **Install Hardware Device Driver** screen appears (**Figure 6-10**). Select the **Search for a suitable driver for my device** radio button and click **NEXT** to continue.



Figure 6-10: Search for Suitable Driver

Step 9: Select **Specify a Location** in the **Locate Driver Files** window (**Figure 6-11**).

Click **NEXT** to continue.

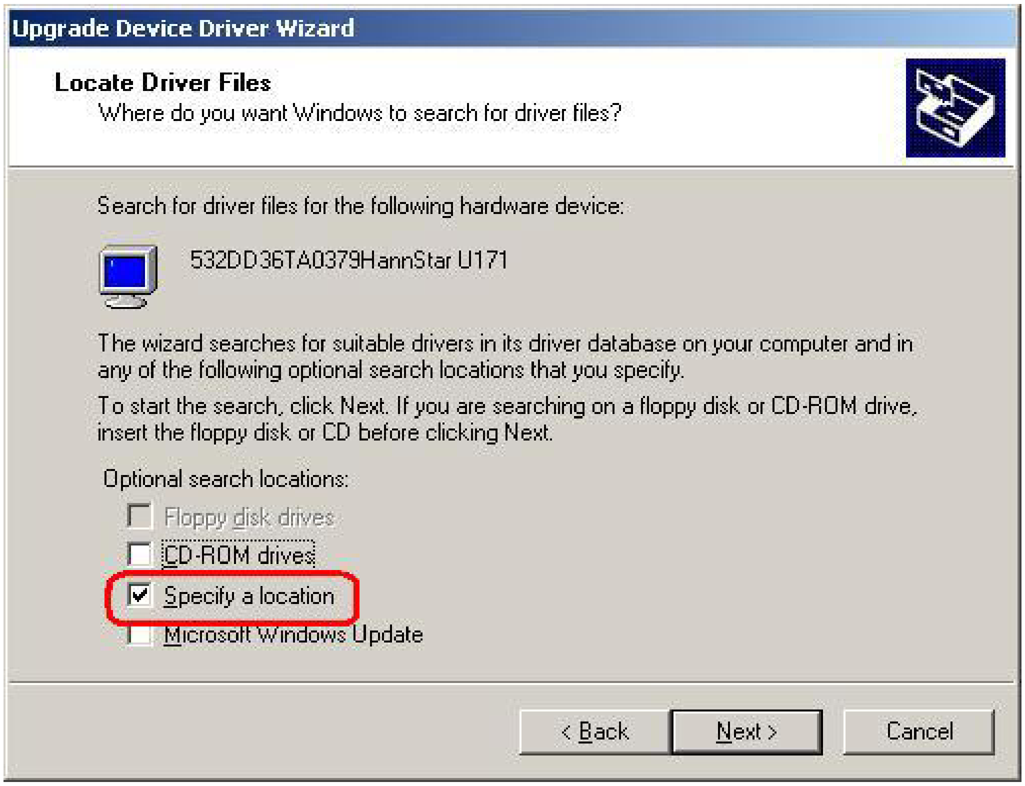


Figure 6-11: Locate Driver Files

Step 10: Click **Browse** and navigate to the **X:\AMD\LX800\XP\VGA 2.01.05** directory, where "**X:**" is the system CD drive (**Figure 6-12**).

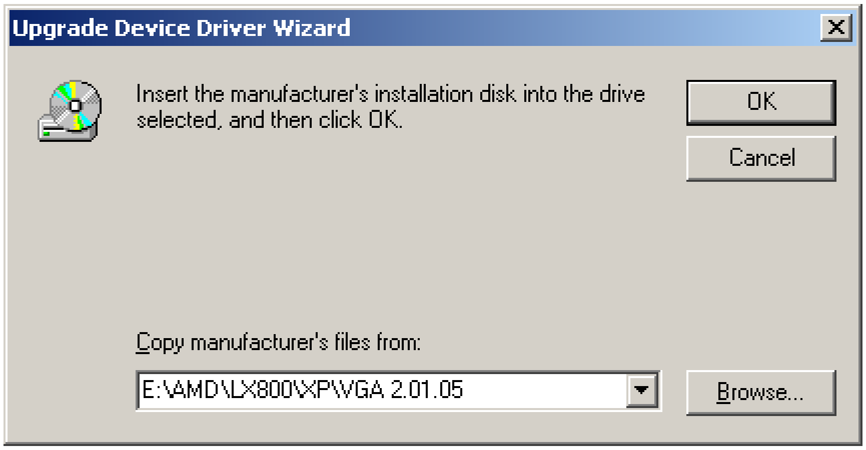


Figure 6-12: Location Browsing Window

Step 11: Click **OK** to continue.

Step 12: A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

6.3 Audio Driver Installation

To install the audio driver please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 6-13**).

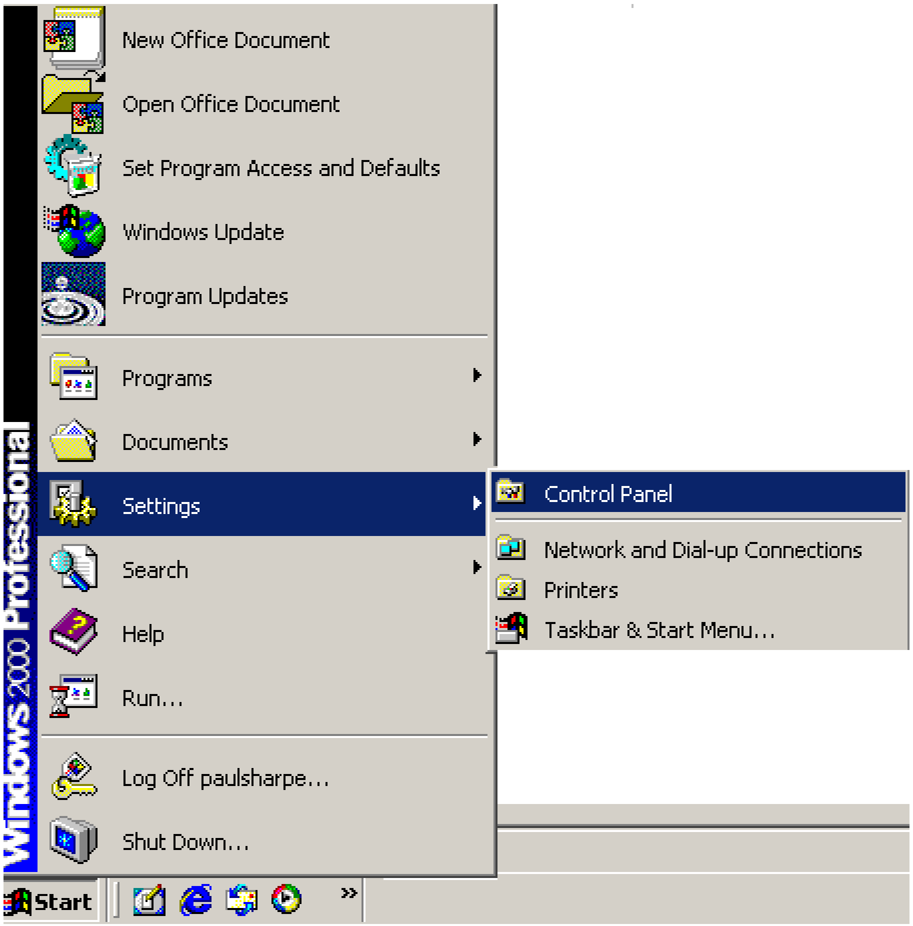


Figure 6-13: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-14**).

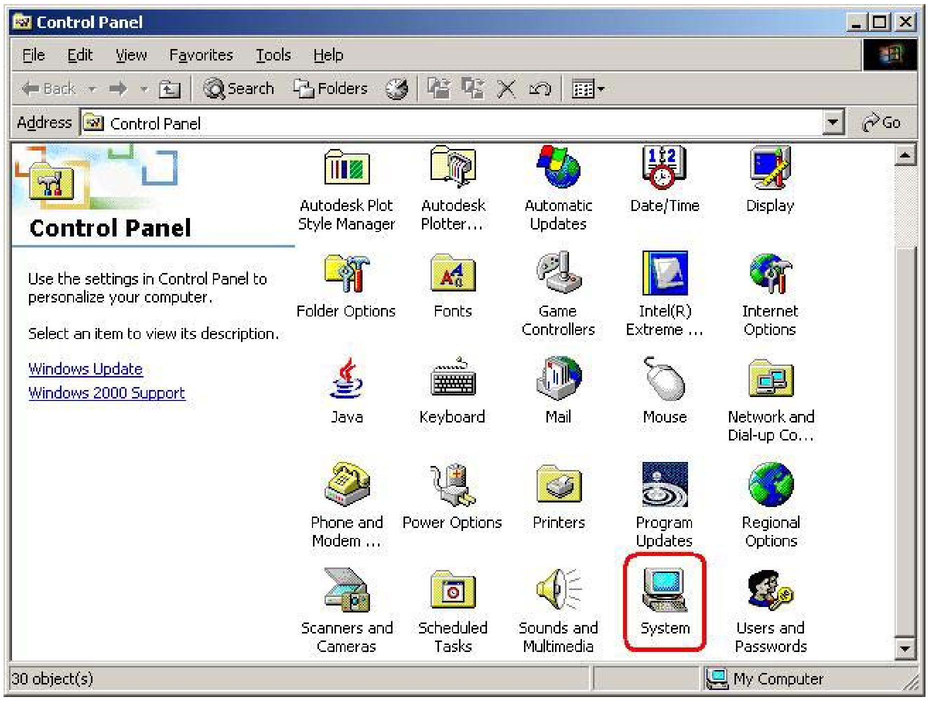


Figure 6-14: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-15**).

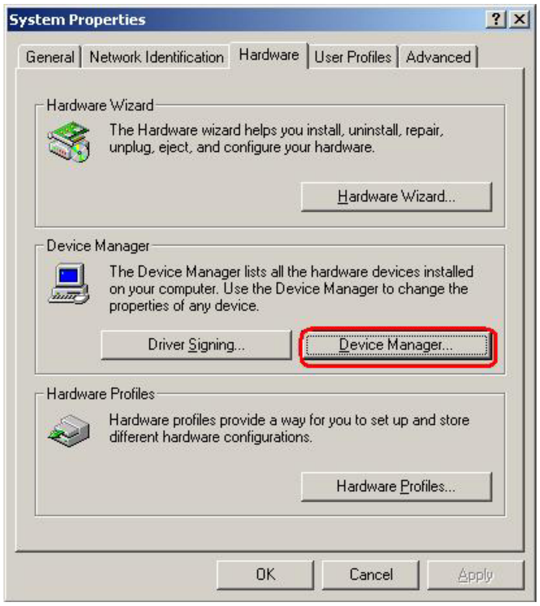


Figure 6-15: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-16**).

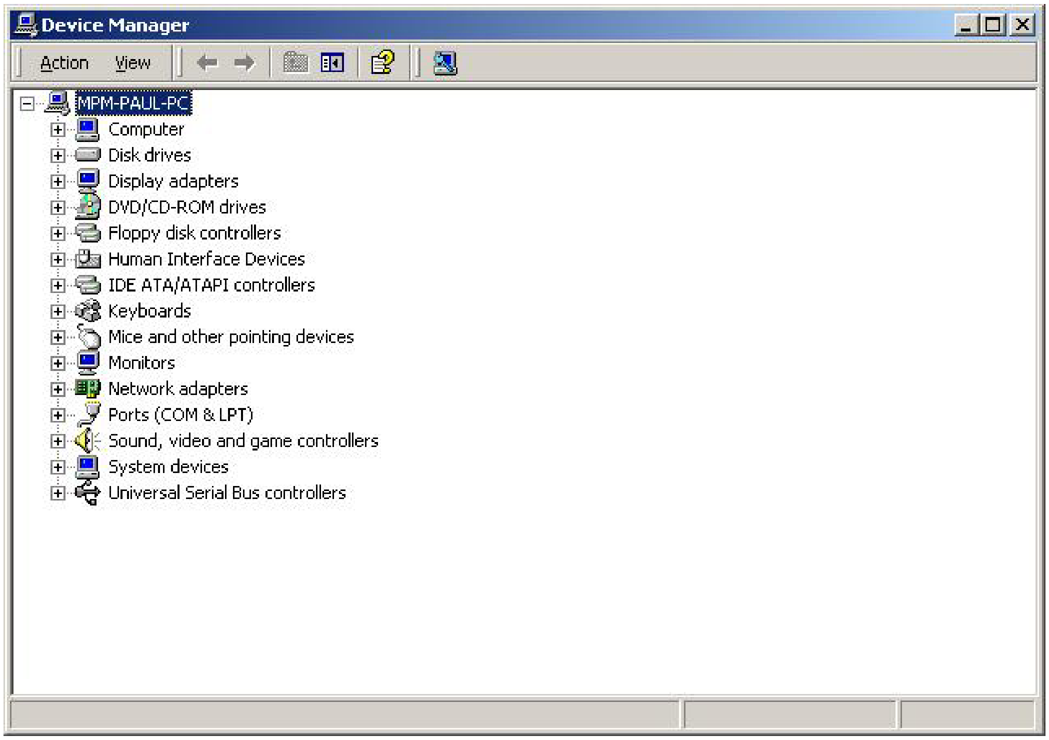


Figure 6-16: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 6-17**). Click **NEXT** to continue.



Figure 6-17: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-18**). Click **NEXT** to continue.

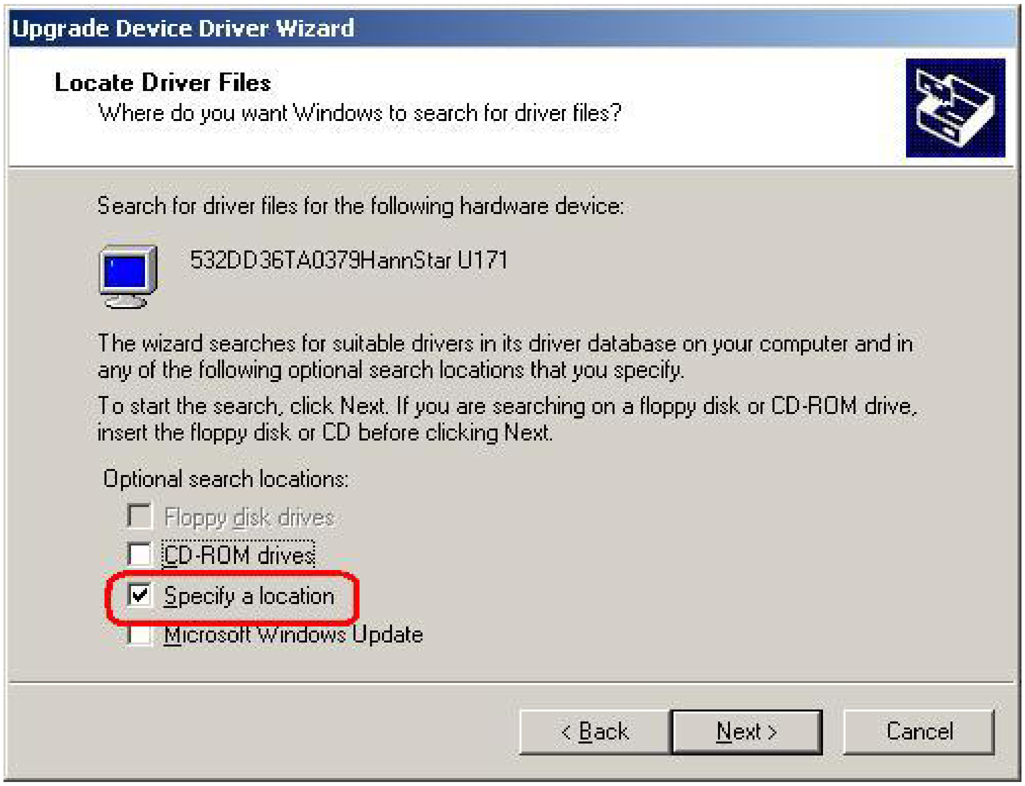


Figure 6-18: Locate Driver Files

Step 8: Select "**X:\ Audio\GeodeLX_XP_XPe_WDM_Audio_v2.03.00**" directory in the location browsing window, where "**X:\"** is the system CD drive (**Figure 6-19**).

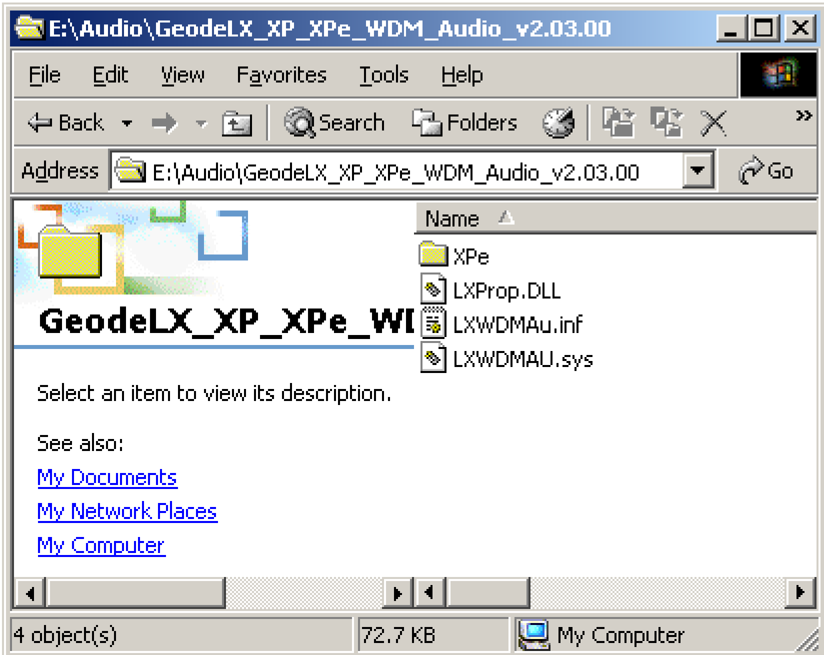


Figure 6-19: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Select the **LXWDMAu.inf** file and click **OPEN** to continue. The driver is installed.

6.4 LAN Driver

To install the LAN driver, please follow the steps below.

Step 1: Click **LAN** from the **AMD LX/GX CD Driver Menu** to open a window to the **X:\LAN\Realtek** (where **X:** is the system CD drive) folder on the driver CD.

Step 2: Open the **RTL8100C** folder.

Step 3: Locate the **Setup** program icon (**Figure 6-20**).

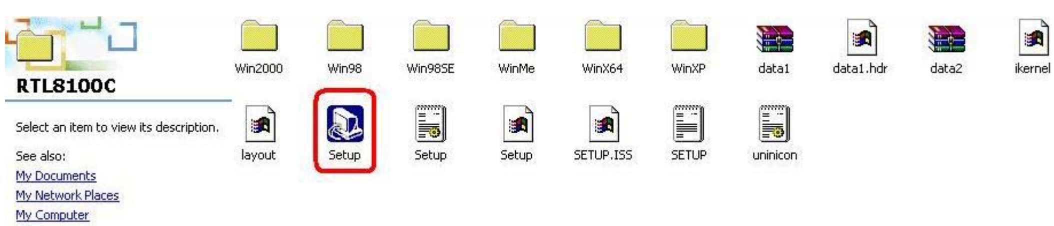


Figure 6-20: Locate the Setup Program Icon

Step 4: Double click the **Setup** program icon in **Figure 6-20**.

Step 5: The **Install Shield Wizard** is prepared to guide the user through the rest of the process (**Figure 6-21**).

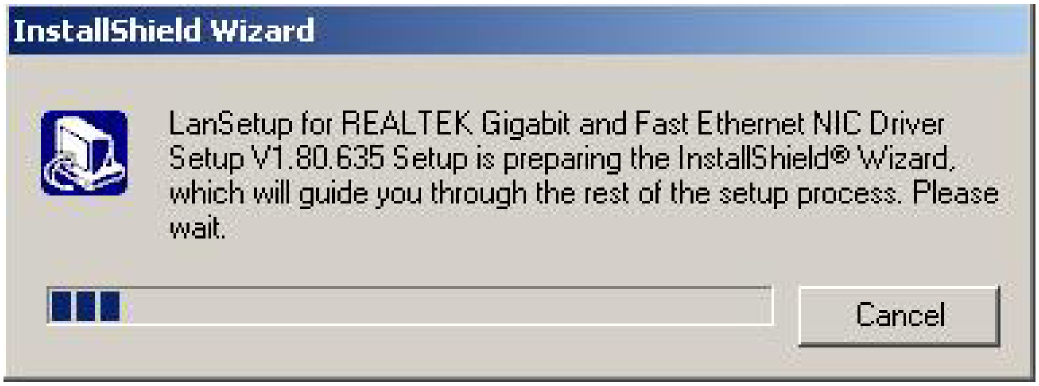


Figure 6-21: Preparing Setup Screen

Step 6: Once initialized, the **Install Wizard** welcome screen appears (**Figure 6-22**).

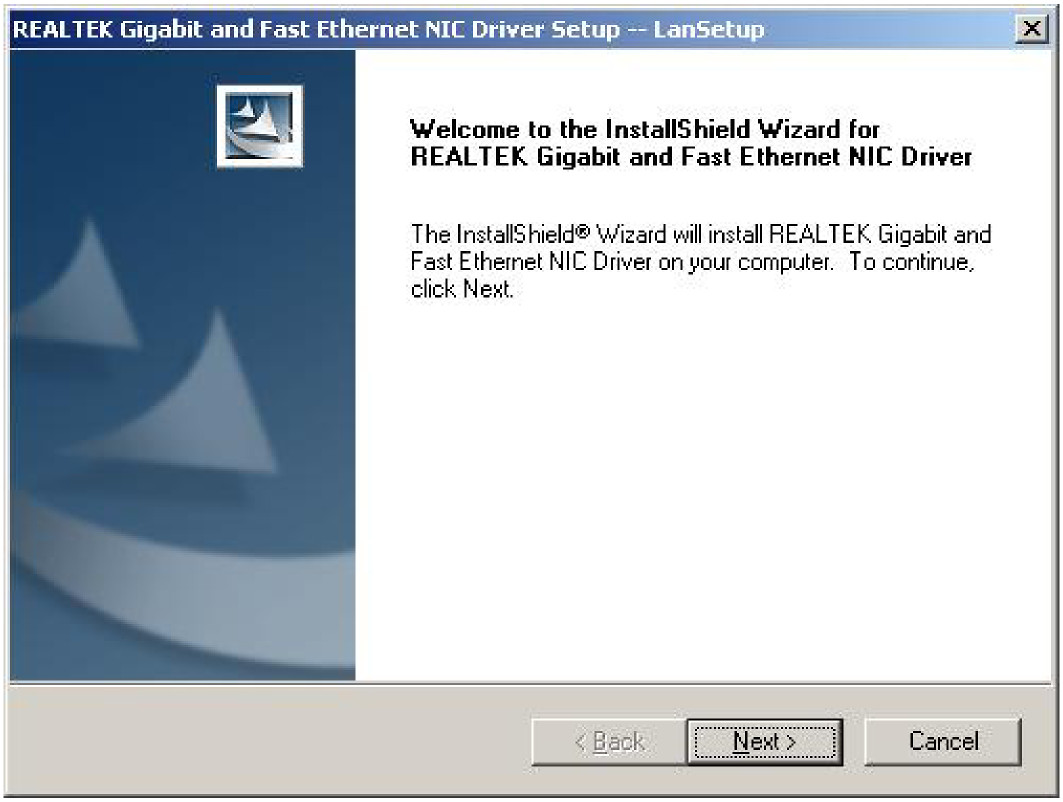


Figure 6-22: Install Wizard Welcome Screen

Step 7: Click **NEXT** to continue the installation or **CANCEL** to stop the installation.

Step 8: The **Install Wizard** starts to install the LAN driver.

Step 9: Once the installation is complete, the **InstallShield Wizard Complete** screen appears (**Figure 6-23**).

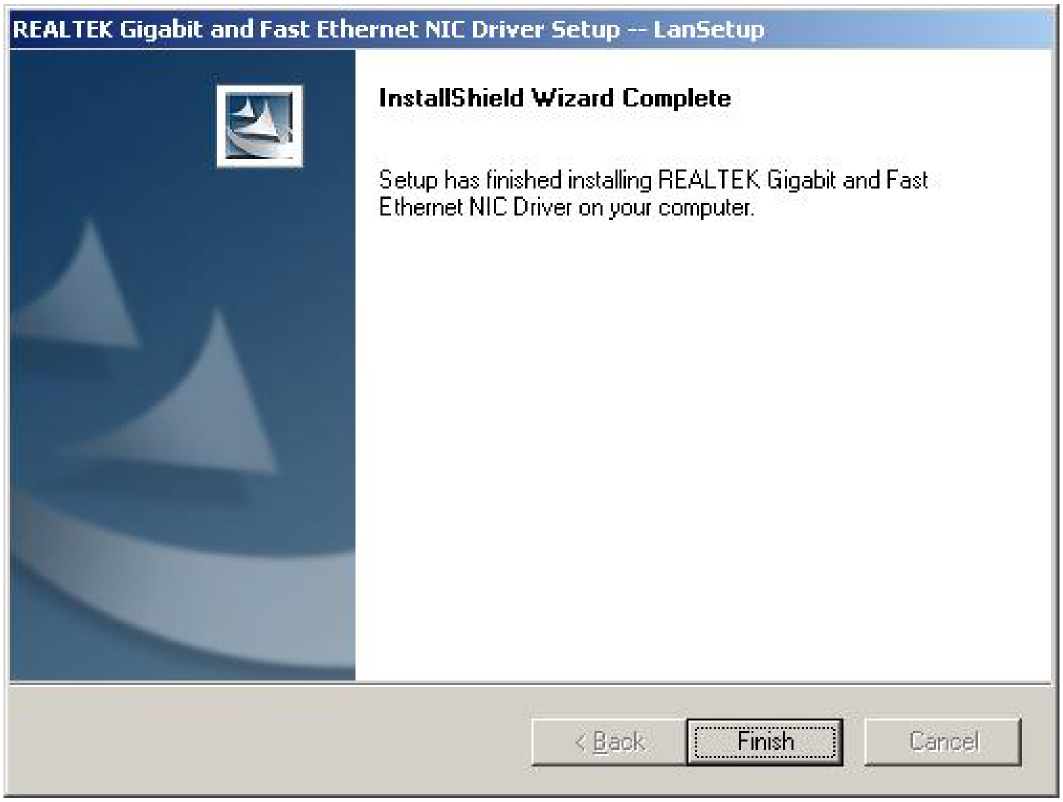


Figure 6-23: Installing Screen

Step 10: Click **FINISH** to complete the installation and exit the **Install Shield Wizard**.

Step 11: Once the installation process is complete, the computer may be restarted immediately or later. Select the preferred option and click **FINISH** to complete the installation process and exit the **Install Shield Wizard** (**Figure 6-24**).

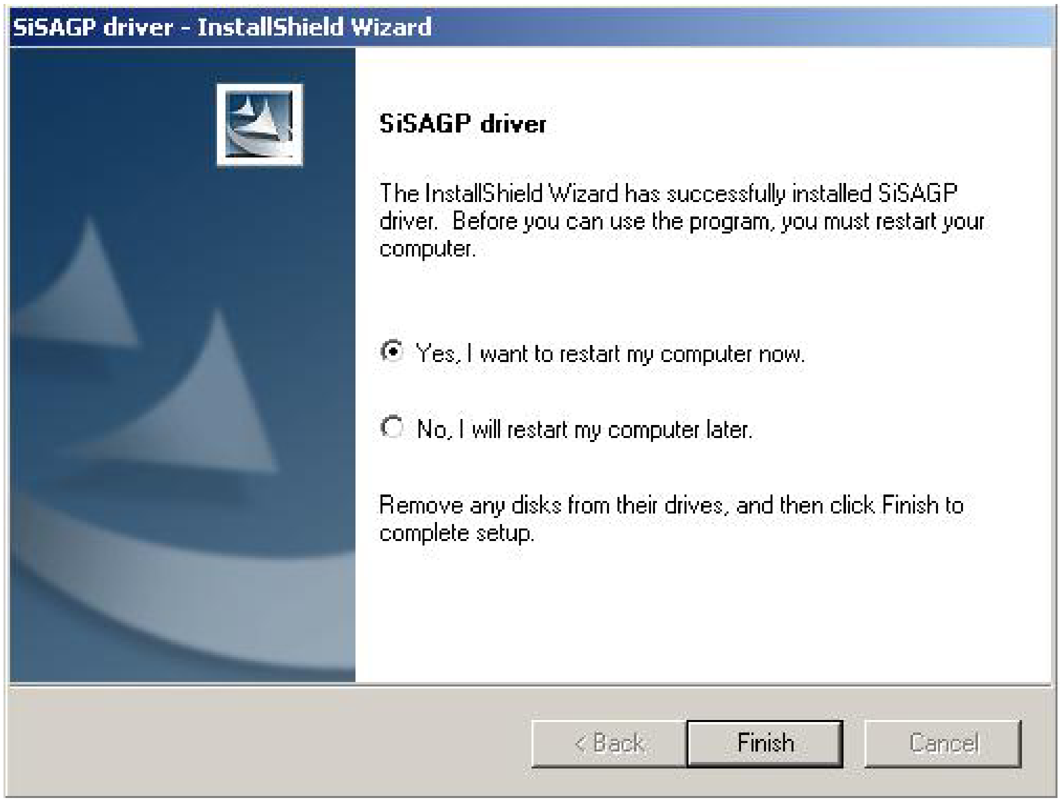


Figure 6-24: Restart the Computer

6.5 SATA/RAID Driver

To install the ALi SATA/RAID driver, please follow the steps below.

Step 1: Click **SATA** from the **AMD LX/GX CD Driver Menu** to open a window to the **X:\ALi_SATA_M5283** (where **X:** is the system CD drive) folder on the driver CD.

Step 2: Locate the **Setup** program icon (**Figure 6-25**).

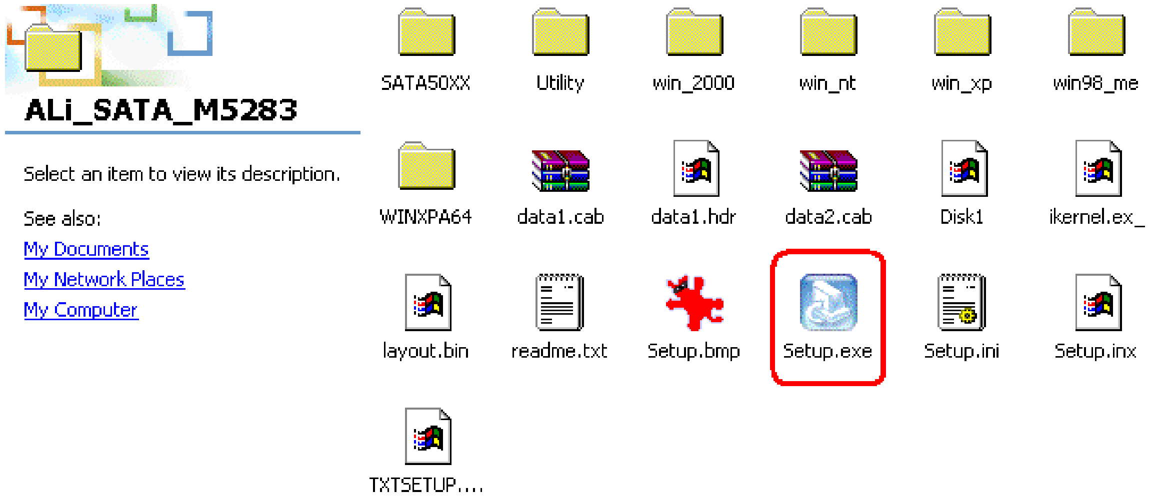


Figure 6-25: Locate the Setup Program Icon

Step 3: The **Install Shield Wizard** (**Figure 6-26**) is prepared to guide the user through the rest of the process.

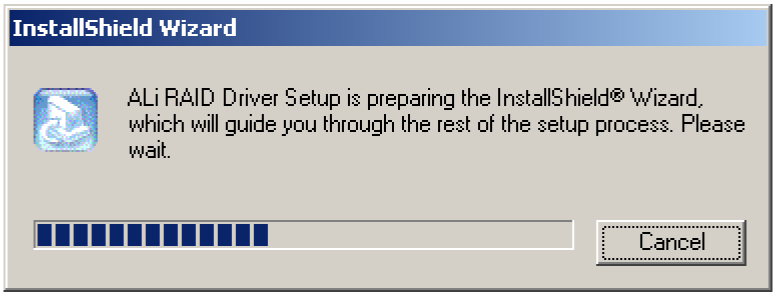


Figure 6-26: Preparing Setup Screen

Step 4: Once initialized, the **Install Wizard** welcome screen appears (**Figure 6-27**).

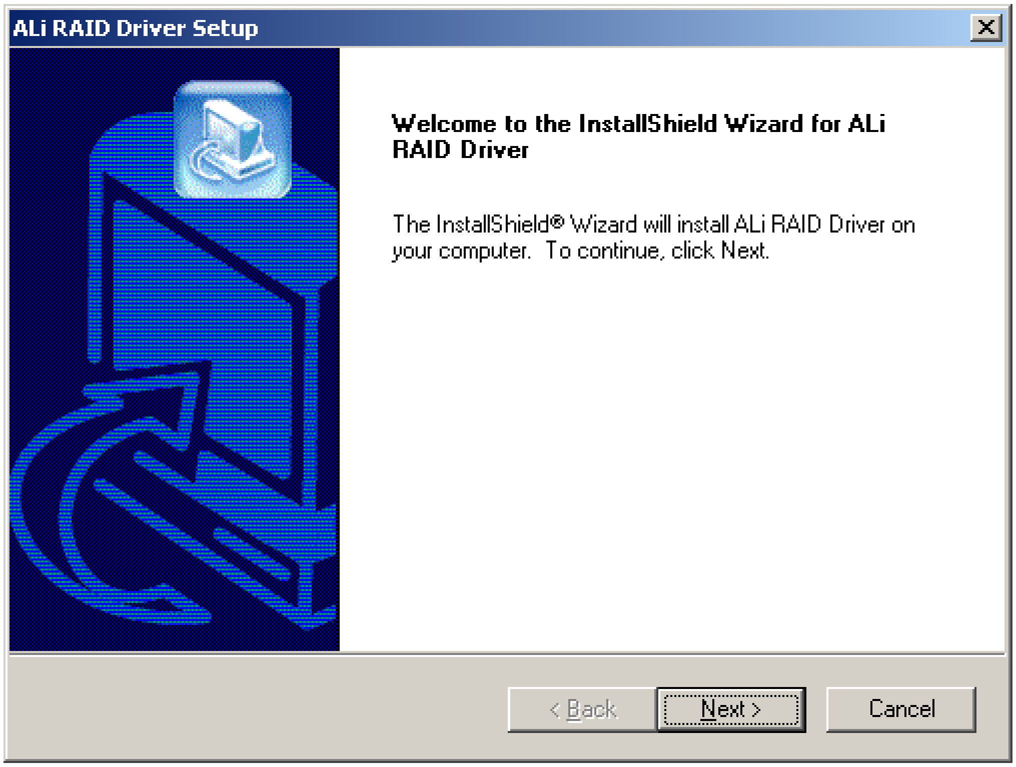


Figure 6-27: Install Wizard Welcome Screen

Step 5: Click **NEXT** to continue the installation or **CANCEL** to stop the installation.

Step 6: The **Install Wizard** starts to install the driver (**Figure 6-28**).

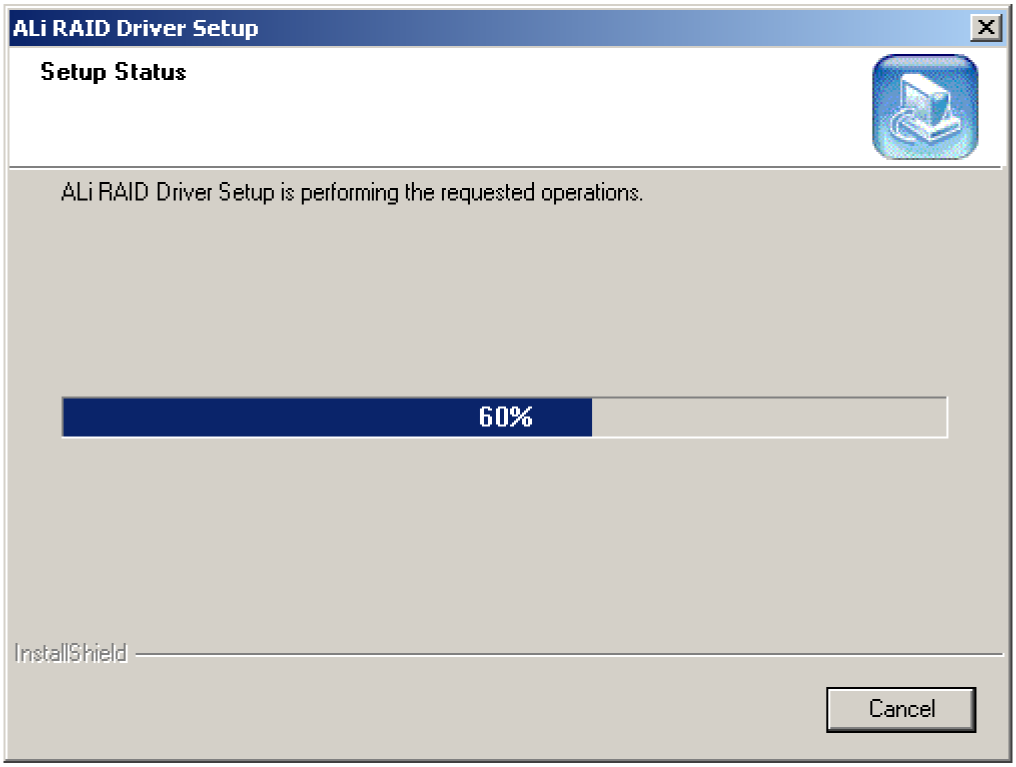


Figure 6-28: Installing Screen

Step 7: A "**Digital Signal Not Found**" screen appears (**Figure 6-29**). Click **YES** to continue the installation process.

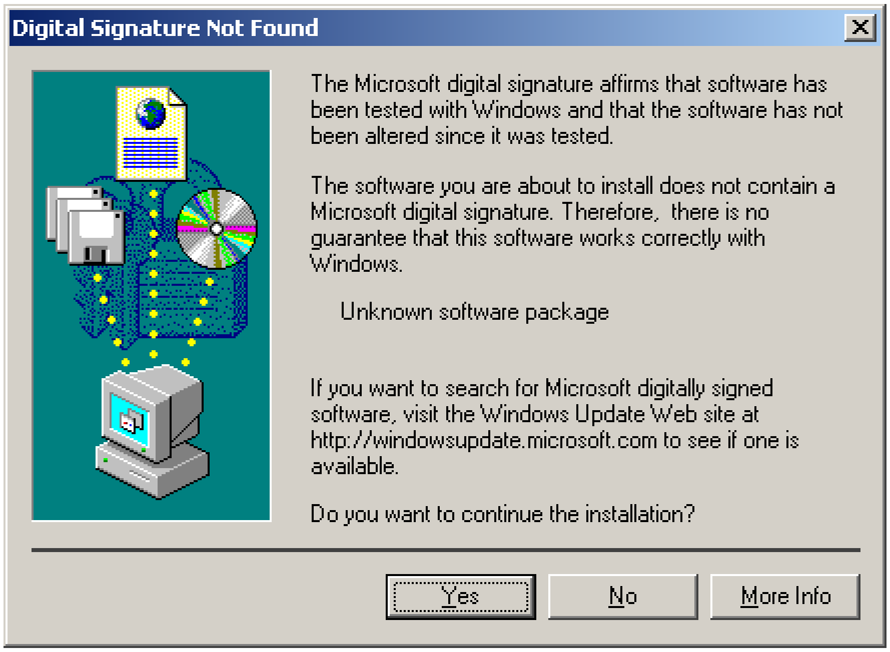


Figure 6-29: RAID Driver Digital Signal

Step 8: Once the installation is complete, the **InstallShield Wizard Complete** screen appears (**Figure 6-30**).

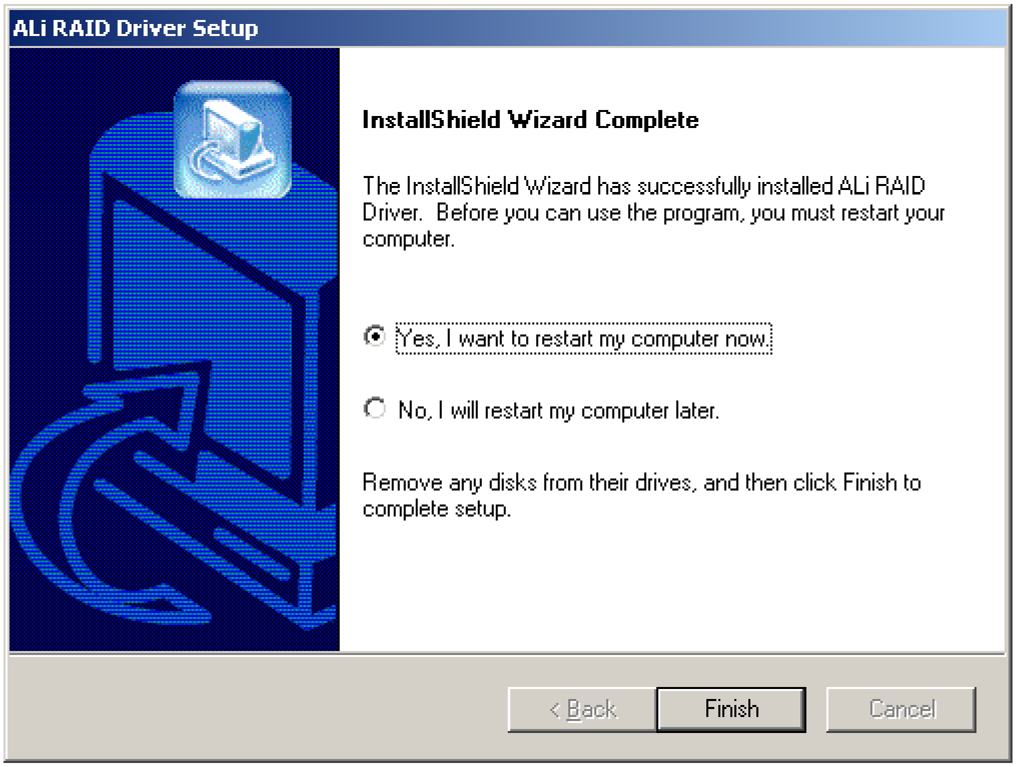


Figure 6-30: InstallShield Wizard Complete Screen

Step 9: Once the installation process is complete, the computer may be restarted immediately or later. Select the preferred option and click **FINISH** to complete the installation process and exit the **Install Shield Wizard**.

6.6 ISA Driver

To install the IT8888 ISA Bridge driver please follow the steps below:

Step 1: Open **Windows Control Panel** (**Figure 6-31**).

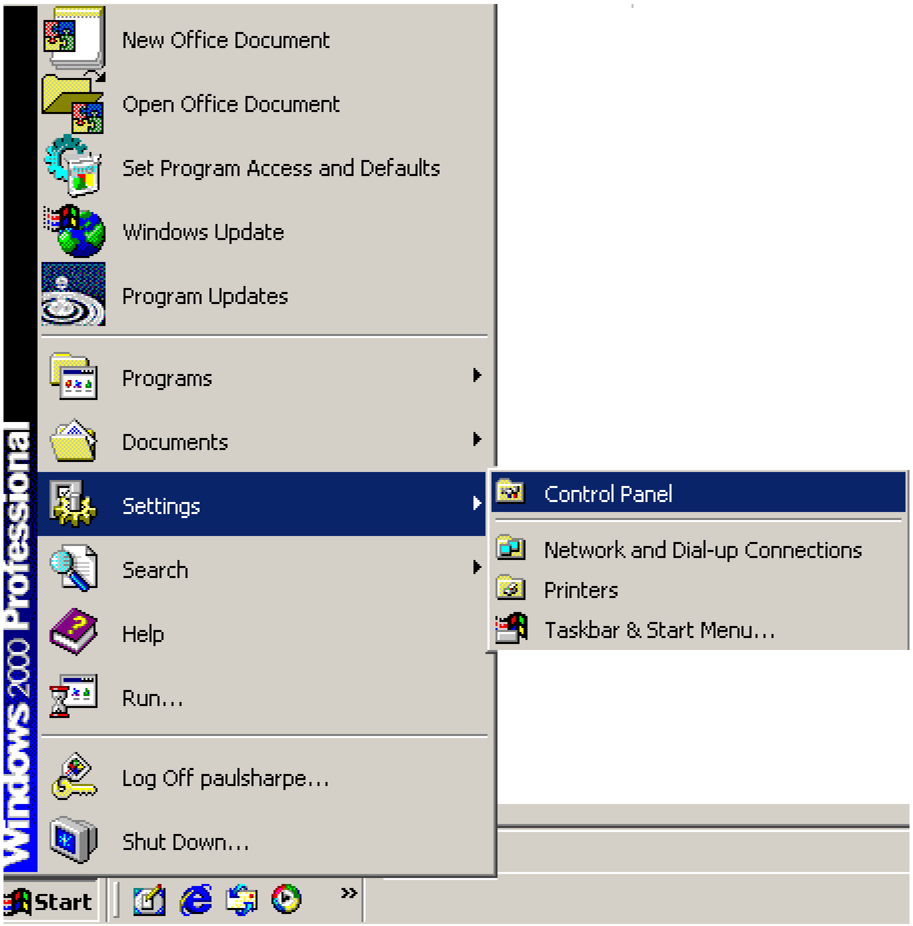


Figure 6-31: Access Windows Control Panel

Step 2: Double click the **System** icon (**Figure 6-32**).

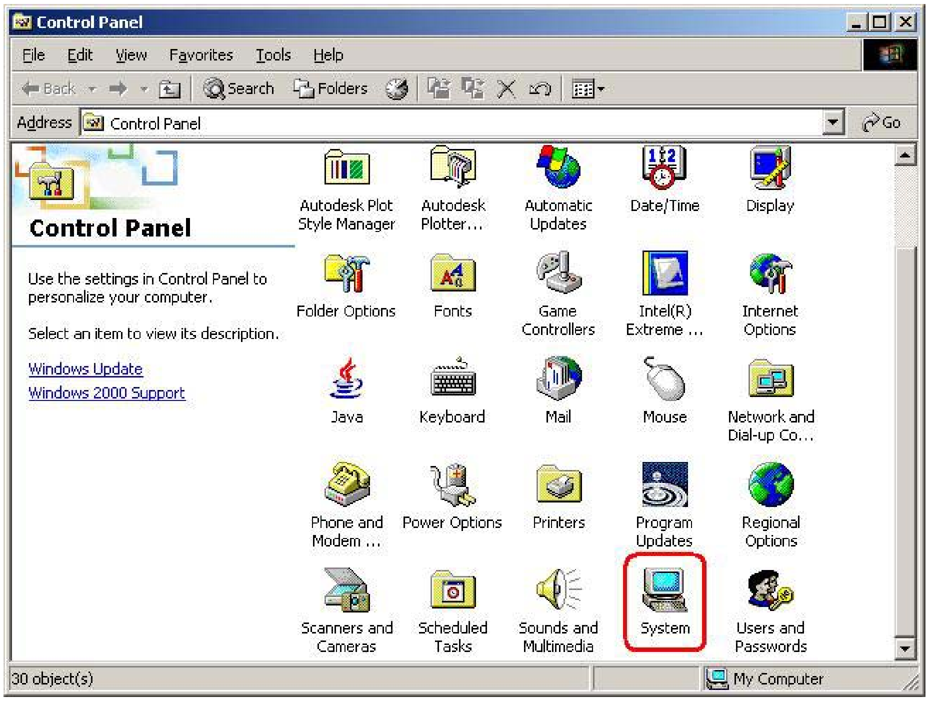


Figure 6-32: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (**Figure 6-33**).

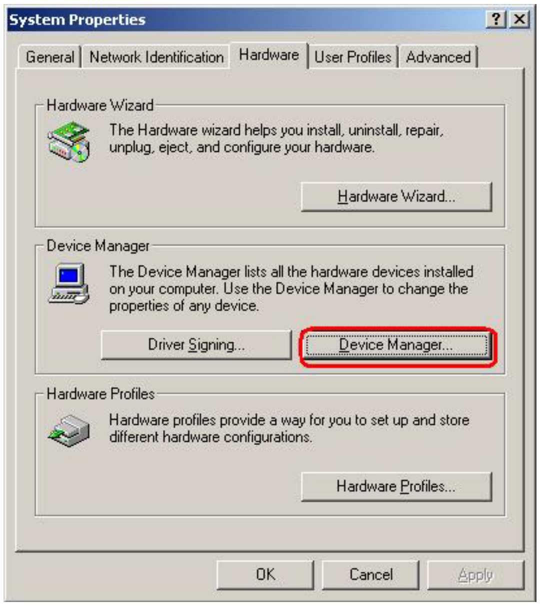


Figure 6-33: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 6-34**).

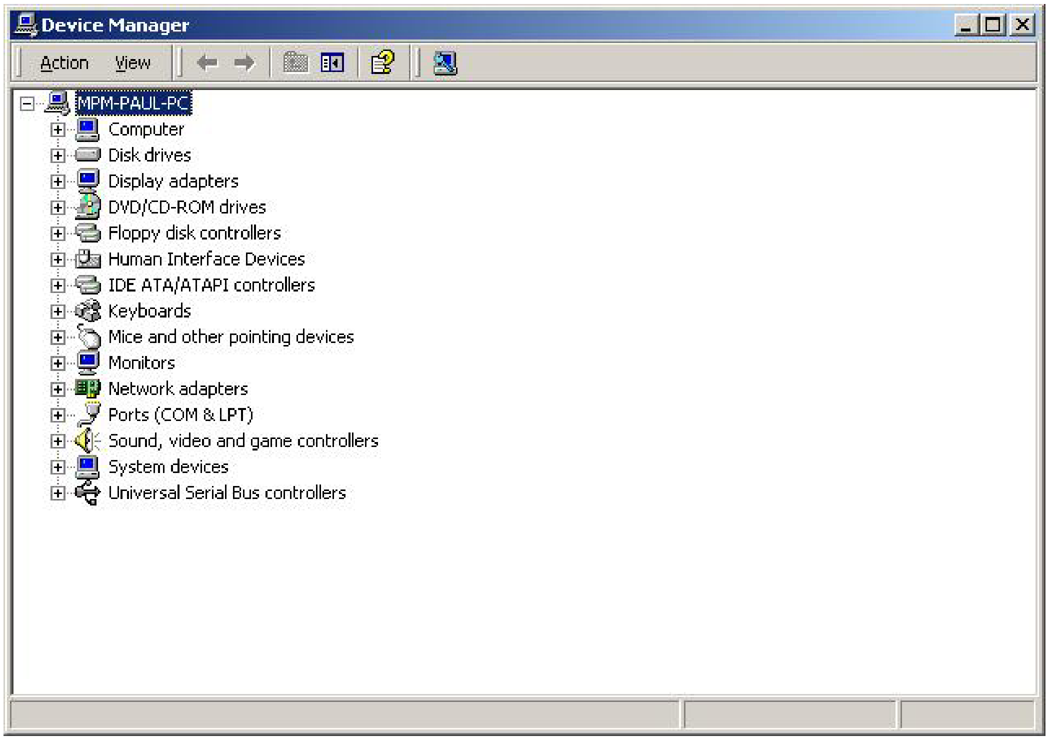


Figure 6-34: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 6-35**). Click **NEXT** to continue.



Figure 6-35: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 6-36**).

Click **NEXT** to continue.

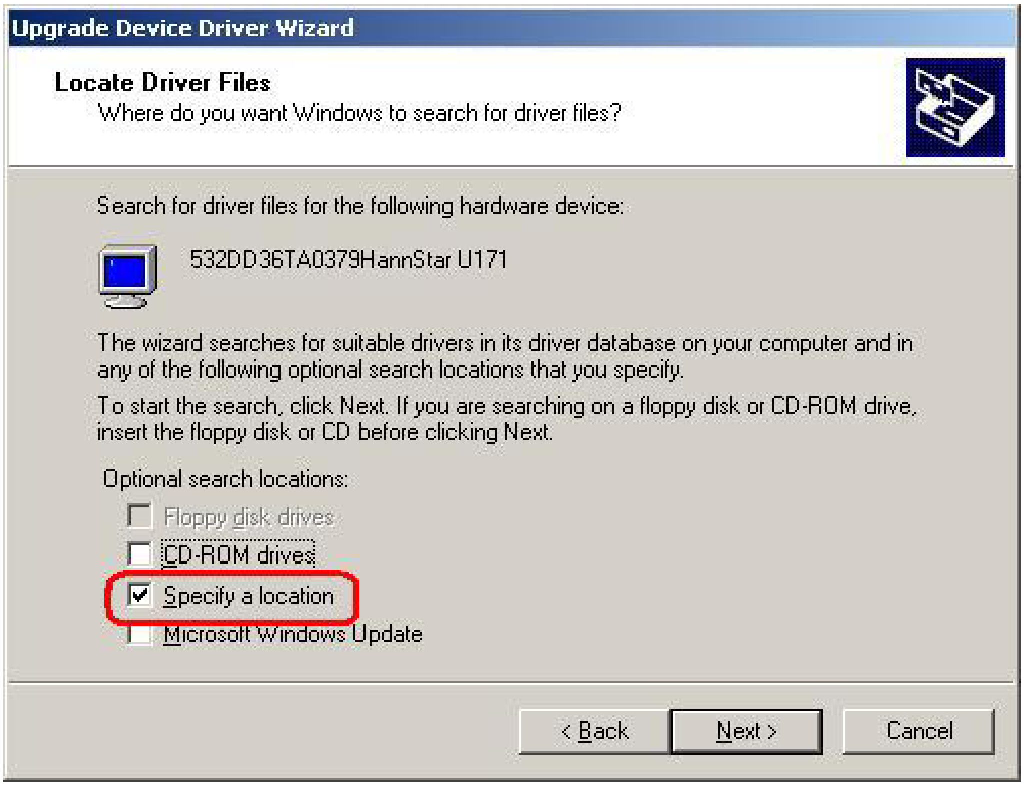


Figure 6-36: Locate Driver Files

Step 8: Select "**X:\IT8888**" directory in the location browsing window, where "**X:\"** is the system CD drive (**Figure 6-37**).

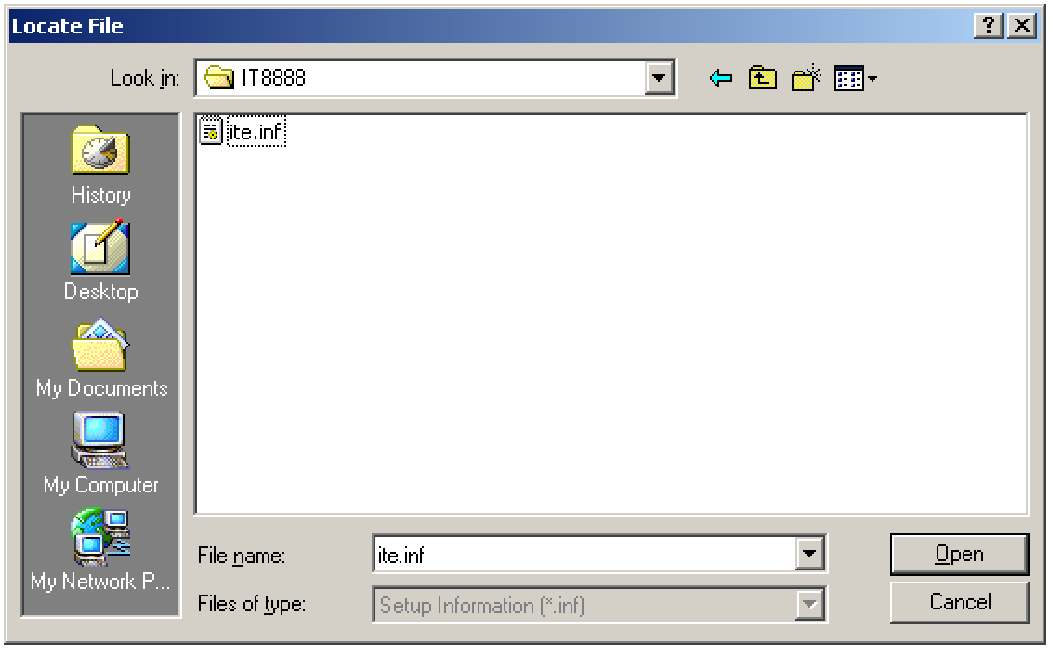


Figure 6-37: Location Browsing Window

Click **OK** to continue. A driver files location menu window appears. Select the **ite.inf** file and click **OPEN** to continue. The driver is installed.

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Appendix

A

BIOS Menu Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix B

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP      ;No, restart the application

        MOV     AX, 6F02H   ;disable Watchdog Timer
        MOV     BL, 0       ;
        INT     15H
;
; EXIT ;
```

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Appendix C

Address Mapping

C.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	SiS661CX Graphics Controller
3C0-3DF	SiS661CX Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: IRQ Mapping Table

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Appendix

D

External AC'97 Audio CODEC

D.1 Introduction

The motherboard comes with an onboard Realtek ALC203 CODEC. Realtek ALC203 is a 20-bit DAC and 18-bit ADC full-duplex AC'97 2.3 compatible stereo audio CODEC with a variable sampling rate.

D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through two phone jacks on the rear panel of the motherboard. The phone jacks include:

1. A LINE output
2. A MIC input line.

D.1.2 Driver Installation

The driver installation has been described in **Section 6.3**.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure D-1**). If the peripheral speakers are properly connected, sound effects should be heard.

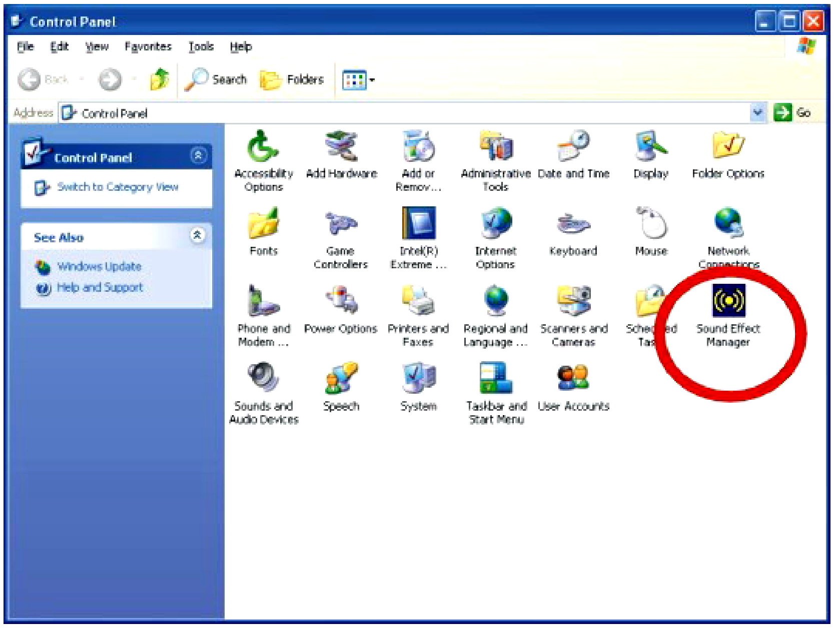


Figure D-1: Control Panel Sound Effect Manager

D.2 Sound Effect Configuration

D.2.1 Accessing the Sound Effects Manager

To access the Sound Effects Manager, please do the following:

Step 1: Install the audio CODEC driver.

Step 2: Click either:

- The **Sound Effect Manager** icon in the **Notification Area** of the system task bar (**Figure D-2**), or
- The **Sound Effect Manager** icon in the **Control Panel** (**Figure D-3**).



Figure D-2: Sound Effect Manager Icon [Task Bar]

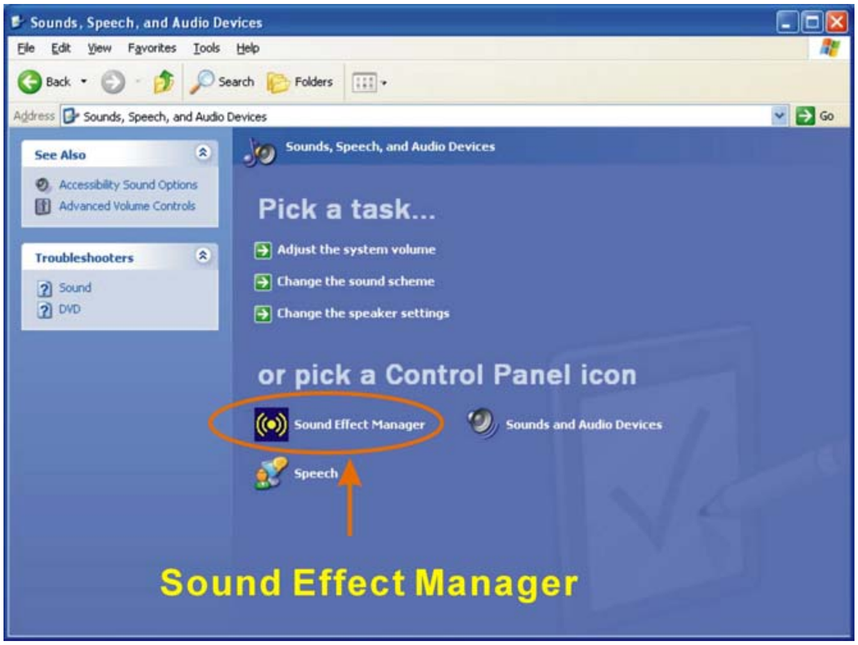


Figure D-3: Sound Effect Manager Icon [Control Panel]

Step 3: The sound effect manager appears (**Figure D-4**).

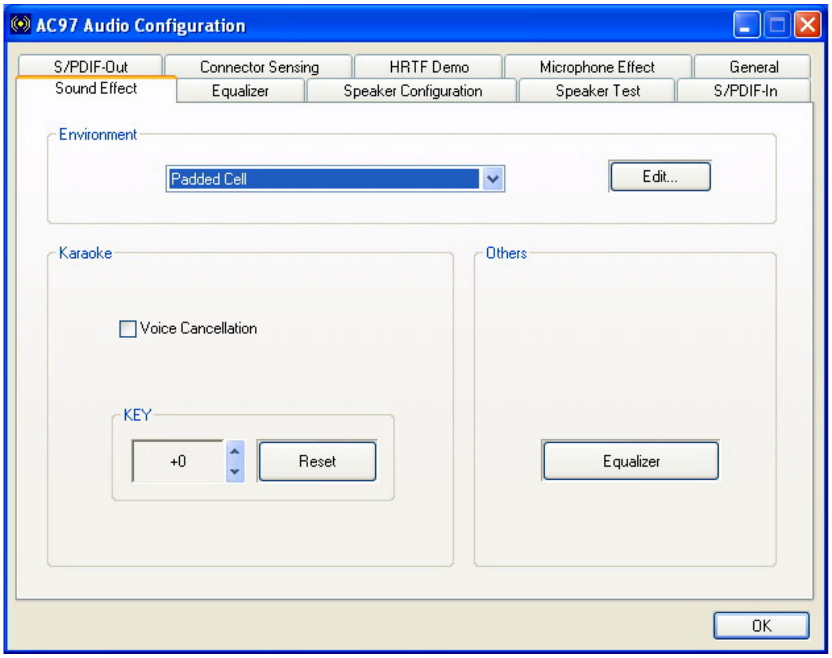


Figure D-4: Sound Effects Manager (ALC203)

NOTE:

The Sound Effect Manager shown in **Figure D-4** is for the RealTek ALC203 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

D.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure D-4**).

NOTE:

The Karaoke Mode is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all RealTek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect***:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click **EDIT**.
- ***Karaoke Mode***:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played.

The **Key adjustment** up or down arrow icons enables users to define a key that fits a certain vocal range.

- ***Equalizer Selection***:- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration***:- Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings
- ***Speaker Test*:-** Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out***:- These functions are currently not supported.
- ***Connector Sensing***:- Realtek ALC203 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in, a warning message appears.
- ***HRTF Demo***:- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.
- ***Microphone Effect***:- Microphone noise suppression is enabled in this menu.
- ***General***:- General information about the installed AC'97 audio configuration utility is listed here.

Appendix E

ALi® RAID for SATA

E.1 Introduction

The ALi M5283 SATA RAID chipset can control parallel ATA (PATA) and serial ATA (SATA) disks. The ALi controller supports PATA UDMA transfer mode up to mode 6 and SATA 1 disk drives. The ALi M5283 also has a cost-effective RAID functionality that can increase the data read/write speed and provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID 1).

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

E.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

E.2 Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Supported Operating Systems include: Windows 98/Me, Windows 2000 and Windows XP
- Windows-based software for RAID management

E.3 Accessing the ALi RAID Utility

To access the Ali RAID Utility, please follow the steps below:

Step 1: **Connect SATA drives to the system**. Connect two SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

Note:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration (JBOD, RAID 0 or RAID 1). If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **Award BIOS** setup program. Next, open the **Advanced** menu. Enable the **SATA ROM Support BIOS** option (see **Section 5.3**).

Step 3: **Save and Exit BIOS**. After the **SATA ROM Support BIOS** option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system.** Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl-A**. When the screen in **Figure E-1** appears press **Ctrl-A** to enter the **ALi RAID BIOS** setup program.

```
ALi RAID BIOS V1.XX
(c) ALi Corporation 2005, All Rights Reserved.
Identifying IDE drives…

Channel 1 Master: None
Channel 1 Slave: None
Channel 2 Master: [Drive Brand Name] [Drive ID number] SATA 1 [Drive Capacity]
Channel 3 Master: [Drive Brand Name] [Drive ID number] SATA 1 [Drive Capacity]

Press Ctrl-A to enter ALi RAID BIOS setup utility
```

Figure E-1: Accessing ALi RAID BIOS Utility

Step 6: **Delete RAID settings and partitions**. The **RAID BIOS Setup Utility** in **Figure E-2** appears. Before configuring the array select the “**Delete All RAID Setting & Partition**”.

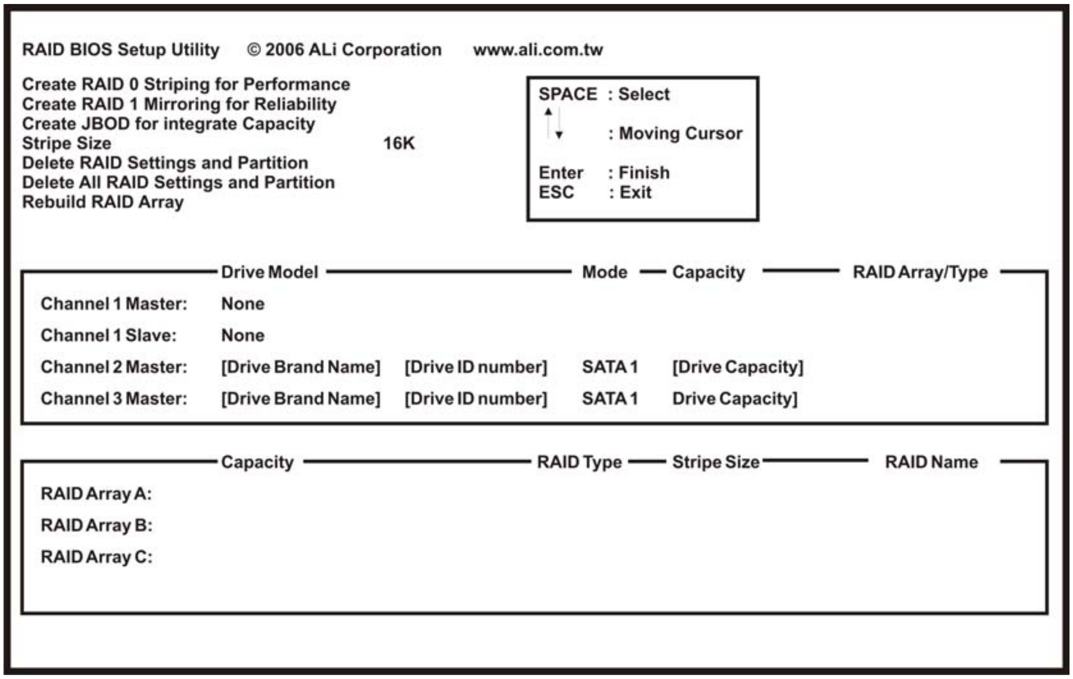


Figure E-2: RAID BIOS Setup Utility

Step 7: **Configure the RAID settings**. Use the **RAID BIOS Setup Utility** in **Figure E-2** to configure the RAID array. Brief descriptions are given below.

Step 8: **Install the OS**. After the RAID array has been configured (see below) install the OS. To do this, please refer to the documentation that came with the OS.

E.4 RAID Options:

E.4.1 Create RAID 0 Striping for Performance

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID 0 Striping for Performance"**. Use the arrow keys to highlight **Create RAID0 Striping for Performance** and press **ENTER**. A flashing 'S' appears on the **Drive Menu** where the member drives to be included in the RAID 0 array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case 's' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

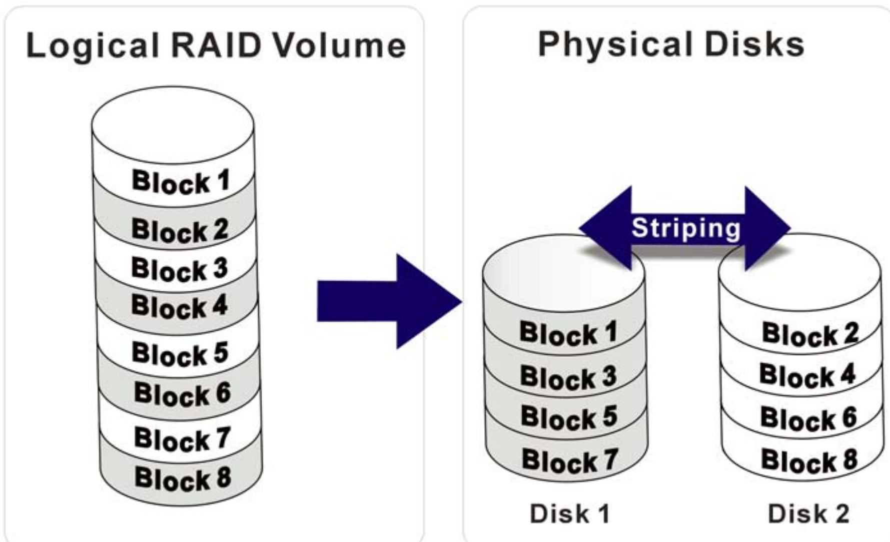
Step 3: **Confirm**. The **Create RAID0 (Y/N)** confirm box appears. Press **Y**.

Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 0 array. Avoid mixing PATA and SATA disk drives in a RAID 0 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.



E.4.2 Create RAID 1 Mirroring for Reliability

WARNING!

All data previously stored on the member drives of a RAID configuration is destroyed during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select "Create RAID 1 Striping for Reliability"**. Use the arrow keys to highlight **Create RAID 1 Striping for Reliability** and press **ENTER**. A flashing 'S' appears on the **Drive Menu** where the member drives to be included in the RAID 0 array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case 's' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3: **Confirm**. The **Create RAID0 (Y/N)** confirm box appears. Press **Y**.

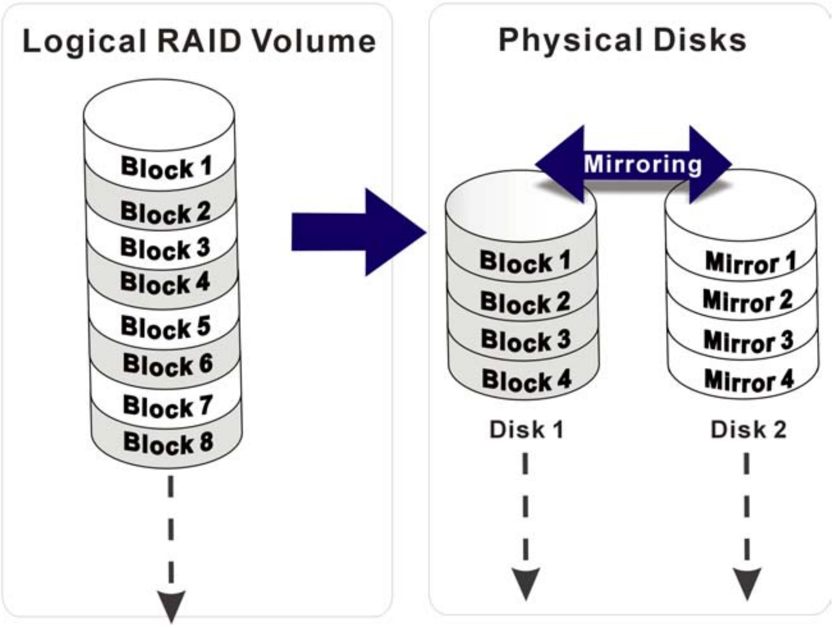
Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array

Step 5: **View the array**. A prompt appears to proceed with drive copy. The **Source** and **Destination** drives are indicated as "M" and "m" in the **Drive Menu**.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. PATA drives connected on the same IDE channel cannot be selected as the members of a RAID 1 array. Avoid mixing PATA and SATA disk drives in a RAID 1 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.



E.4.3 Create JBOD for Integrated Capacity

JBOD is defined as "Just a Bunch of Drives." JBOD provides neither performance gains nor data redundancy.

WARNING!

All data previously stored on the member drives of a RAID configuration is destroyed during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create JBOD for Integrated Capacity"**. Use the arrow keys to highlight **Create JBOD for Integrated Capacity** and press **ENTER**. A flashing 'J' appears on the **Drive Menu** where the member drives to be included in the JBOD array can be chosen.

Step 2: **Select RAID array drive members**. Use the space bar to select members of the RAID array. The flashing cursor changes to a lower case 's' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3: **Confirm**. The **Create RAID 0 (Y/N)** confirm box appears. Press **Y**.

Step 4: **Name the array**. Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array

NOTE:

To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID1 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID1 array.

E.4.4 Stripe Size

Changing the stripe size effects RAID 0 arrays. Configurable options are:

- 64K (default)
- 32K
- 16K
- 8K
- 4K

Select a small stripe size if the I/Os to the hard drives are small and occur randomly. Choose a larger stripe size if the I/Os are mostly large and come in sequential orders, e.g., A/V playback and editing applications. The default value should be appropriate for most applications.

E.4.5 Delete RAID Setting & Partition

WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: **Delete a RAID setting**. Use the arrow keys to highlight **Delete RAID Setting & Partition** and press **ENTER**. A flashing 'E' appears at the **Drive Menu** where the member drives to be removed can be chosen.

Step 2: **Confirm Delete**. The **Data on RAID drives will be erased (Y/N)** confirm box appears. Press **Y**.

E.4.6 Delete All RAID Setting & Partition

WARNING!

If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: **Delete RAID Settings**. Use the arrow keys to highlight **Delete All RAID Setting & Partition** and press **ENTER**.

Step 2: **Confirm delete**. The **Data on RAID drives will be erased (Y/N)** confirm box appears. Press **Y**.

E.4.7 Rebuild RAID Array

The Rebuild RAID Array option can rebuild a RAID array if a member of a RAID configuration should fail. Neither RAID 0 nor JBOD provides data redundancy. The Rebuild RAID Array option only applies to RAID1 arrays and is applicable when a member of a RAID1 configuration has failed.

Step 1: **Select Rebuild Array**. Use the arrow keys to highlight **Rebuild RAID Array** and press **ENTER**. A flashing ‘R’ appears in the list of existing arrays. The source and destination drives will be displayed.

Step 2: **Confirm rebuild array**. Press **Y** to begin the rebuild process.

NOTE:

A status bar will indicate the rebuild progress. Rebuild consumes considerable system resources and the time required for rebuilding a RAID array may vary depending on the size of stored data, disk drive capacity, and drive performance.

E.4.8 Select Boot Drive

Step 1: **Select the Boot Drive.** Use the arrow keys to highlight **Select Boot Drive** and press **ENTER**. A flashing 'A' appears at the **Drive Menu** where the boot drive can be chosen.

Step 2: **Press ENTER.** Press **ENTER** or the space bar to finish the configuration.

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